ENGINEERING AND MINING JOURNAL

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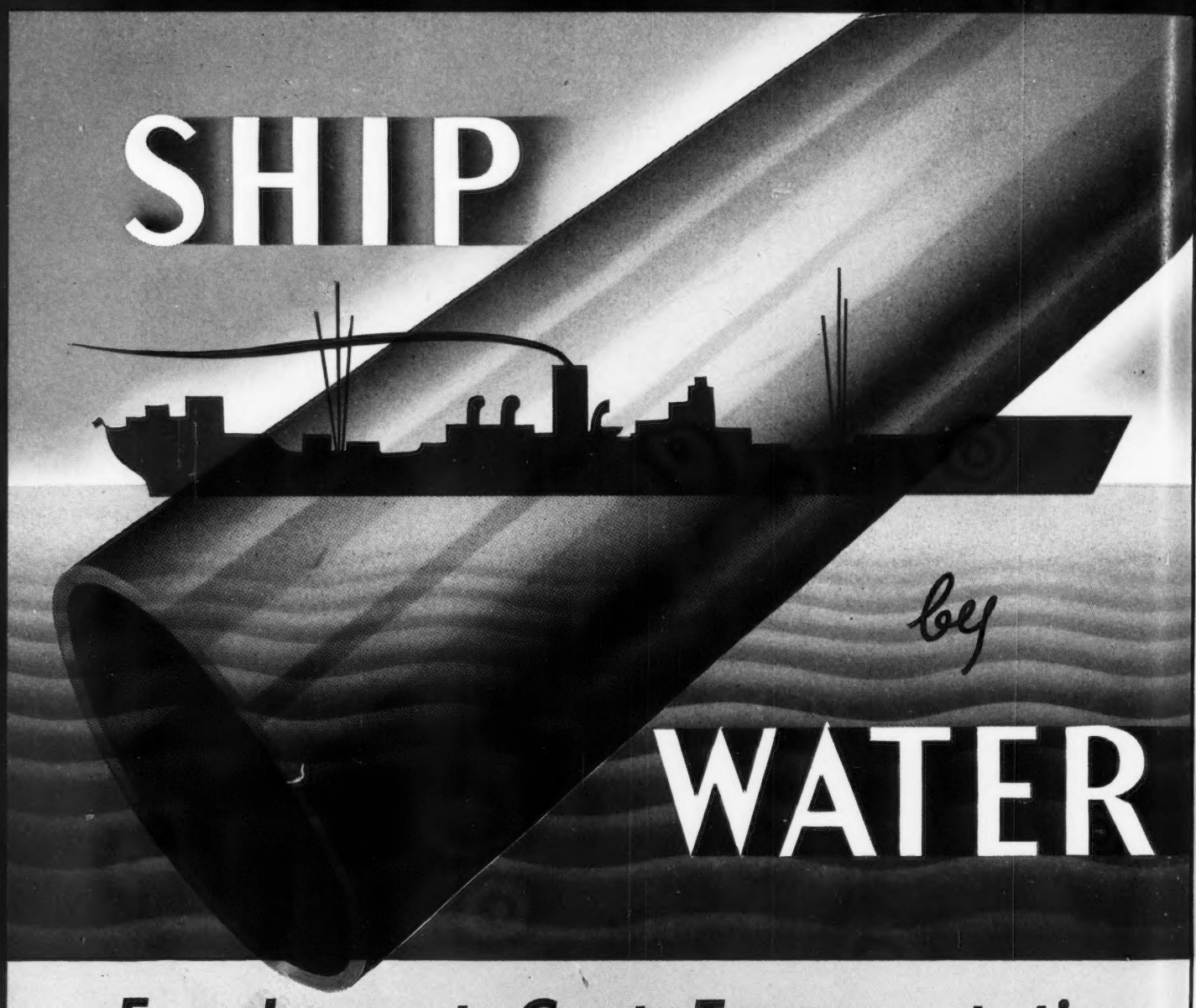
Take a Look at Mining—Ex-Serviceman Page 74



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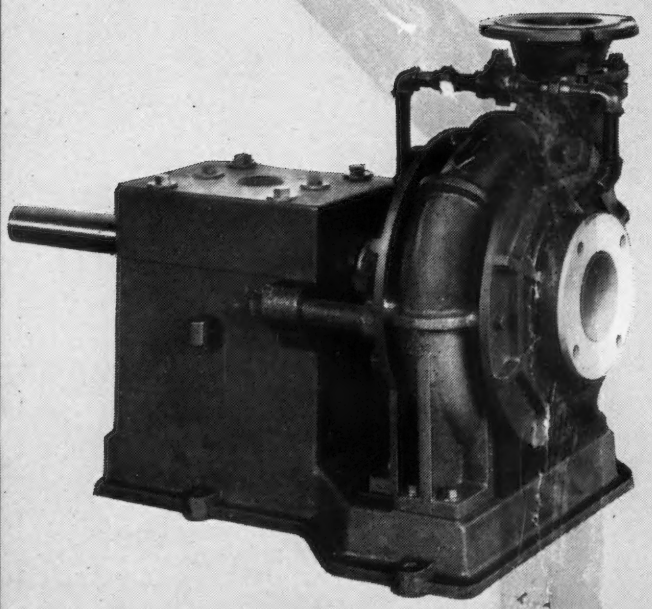

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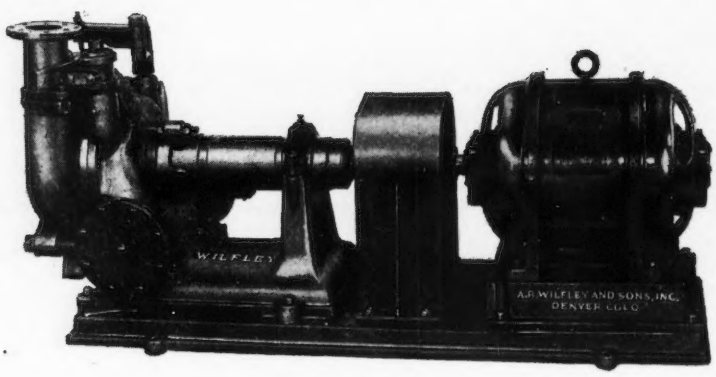

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THE GERMAN ECONOMIC PEACE HARD, SOFT... or WORKABLE?

IT is not surprising that difficulties are being encountered in spelling out the detailed terms of the German economic settlement.

The problem is exceedingly complex. The German economy is more or less inextricably bound up with the economy of continental Europe. Before the war that area—excluding the United Kingdom, Ireland and Russia—accounted for approximately one-fourth of the world's production, and for more than thirty-five per cent of world import and export trade. Germany's production constituted almost one-third of the output of continental Europe. It is obvious that the decisions we make now concerning the future German economy will exert profound influence not only upon the economy of Europe but also upon that of the world. It is clearly not practicable to plan for an expanding world economy unless provision is made for Europe generally to share in the development.

Despite the magnitude and complexity of the problems involved, it is crucial that we and our Allies come to swift and decisive agreement. Such agreement is important both to world economic reconstruction, and as a demonstration that those who won the war can reach accord on the terms of world economic rehabilitation.

We shall accomplish little if we continue to debate in terms of *adjectives*. Yet most of the public discussion to date has centered around whether or not the economic settlement with Germany should be *hard* or *soft*. To make progress we must focus instead upon *objectives*. A good program is one that will promote our objectives—a bad program is one that will not.

What Are We Trying To Accomplish?

Upon the economic objectives of the German peace settlement there is little fundamental debate. This is demonstrated by reference to a number of documents of recent release—the United States Directive to General Eisenhower of April 1945, the Report of the Tripartite Conference at Berlin of July, the Report of the American Advisors to the Office of Military Government of September. The latter document stresses fundamental difficulties in developing a practical program for carrying out the objectives of the other two, but it does not question their formulation of aims.

What are the objectives that we are seeking to forward:

1. The disarmament of Germany.

2. The elimination of German industries devoted primarily to armament production.

3. The assessment of reparations to compensate those nations which have suffered losses from German aggression through direct war destruction and through the German policy of confiscating industrial equipment to her own use.

How Far Are We Agreed on Procedure?

There is also a wide measure of agreement upon detailed procedure for carrying out these objectives. No one, of course, questions the policy of confiscating German arms. Equally, there is agreement that German industry devoted directly to the production of war equipment should be confiscated or destroyed, and that control measures should be instituted and sustained to prevent her from reconstituting such industries in the future. Since it is not practicable to prevent aircraft production and shipbuilding from being diverted to military use, these industries are included in the armament category. And similar reasoning generally extends the list of prohibited industries to ball bearings and abrasives.

There is an additional category of German production which all of the Allied powers agree should be uprooted and permanently barred. It embraces all economic activity which prewar Germany cultivated on an uneconomic basis through subsidy and other protection for the prime purpose of developing a self-sustaining economy to support aggressive war.

The major elements in this category are not difficult to define. A great German industry for the synthetic production of gasoline and other oil products from coal never operated upon an economic basis. The cost of such fuel products to prewar Germany averaged almost four times what it would have cost her to buy petroleum products in the world market. It is doubtful whether these plants could be operated postwar at a cost much below three times the world market price for competing petroleum products.

A similar situation applies to German synthetic rubber production. In an attempt to free herself at least partially from dependence upon supply lines, she produced synthetic rubber at a cost at least double the world market purchase price. Similarly, she protected or otherwise subsidized a considerable agricultural production, particularly in grains, for which her lands were so ill suited that Germans had to pay for German-grown wheat from three to four times the world market price.

These are merely outstanding examples. The maintenance of such activities in Germany constituted a drain upon the German economy rather than an advantage other than that of preserving a self-sufficiency necessary for war. Hence their elimination is clearly indicated, and generally subscribed to, though the job of defining a complete list is far from easy.

What Is The Area of Dispute?

Unfortunately, this total catalogue of agreed-upon measures is not sufficient to provide either adequate security against a resurgence of German militarism or satisfactory restitution to her European neighbors for Germany's ruthless destruction of their industrial plant and equipment. To serve these two ends it is necessary to cut down the margin of German dominance in heavy industry—in steel, in electric power, in machine tools, and other industrial equipment. Unless such steps are taken, Germany will emerge from the war with sufficient industrial power to provide a continuing and perhaps uncontrollable military threat; and we should be perpetuating a dominance that was developed, as a matter of German strategy, far beyond the requirements of her civilian domestic markets or the export potentials of normal trade.

German steel capacity was built to a wartime peak of twenty-four million tons a year. Before the war she had accumulated a store of machine tools greater than that of the United States, and her present stock of some four or five million tons of such tools is second only to ours. There is little debate over the necessity and justice of cutting down the margin of German dominance in heavy industry, particularly since it was built to its current levels through aggressive economic warfare to serve as an instrument of actual warfare. It is recognized, too, that in this sector of the German economy will be found the most useful reparations in kind for the countries damaged by German aggression.

The question is how much heavy industry and electric power equipment should be taken from Germany and transferred to others. The Russians, having experienced colossal war damage, are demanding very severe assessments. They talk of reducing postwar German steel capacity to three million tons annually.

The United States inclines to assessments in this field of less extreme dimension—we have suggested leaving in Germany an annual steel capacity of from seven to ten million tons. We naturally are concerned lest action be taken that will cause a complete breakdown of the German economy. If this should happen while we maintain occupational forces there, we should feel responsible for seeing that the Germans within our jurisdiction are provided with at least the means for subsistence. Furthermore, both we and the British know that in the long run our peoples will not support control measures over Germany which go beyond our concepts of reasonable fairness consistent with security requirements.

It is no part of our intention, as has been suggested by some, to provide for a German economy that will serve as a buffer against Russian expansion. We know, however, that our weakest course would be to commit ourselves now to continuing control measures which our people would later repudiate as falling outside democratic concepts of justice. On this issue we cannot, and should not, compromise.

How Can We Resolve Our Differences?

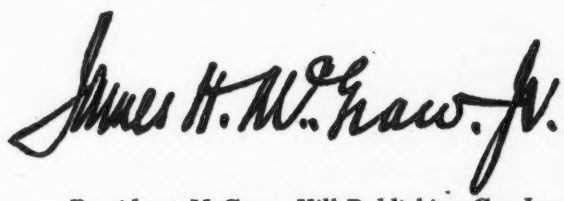
The best chance for resolving the differences which have appeared between the Russian position on the one hand and the American and the British position on the other lies in making a sharper distinction than has appeared in current discussion between long-term and short-term control decisions. All of us are agreed upon the policy of wiping out German military production and that part of German economic activity which has been run at economic loss to provide for a national self-sufficiency useful only for war purposes. But we are unwilling to enter into long-term commitments for holding down those parts of the German economy that do not constitute a war threat. That would unduly penalize future generations of Germans and drag down the whole economy of continental Europe.

It should be possible to reach agreement that measures for cutting down German heavy industries and power-generating facilities are immediate measures, and that no attempt will be made to sustain such controls over an extended period. If part of the German establishment in these fields is transferred to countries whose manufacturing resources have been damaged by German aggression, it can serve the purpose of effecting a reasonable balance without destroying utterly incentives for a new generation of Germans to improve by peaceful methods their status in a peacetime world.

Such a program is consistent with the concept of building a healthy and balanced European economy in which general economic interdependence provides one of the essential safeguards against a resurgence of German militarism. We must still face the problem of agreeing upon how far the non-armament segments of German industry can be cut back at the present juncture without leading to disastrous breakdown with its resultant chaos. Such definition, though formidably difficult, should not be beyond the capacities of the nations whose combined might brought victory, and who have the strongest of incentives for devising a lasting peace.

The key to agreement lies in each of us doing his best to understand the position of the other. Russia must recognize that we cannot get our people to subscribe to the permanent repression of a European economy which would deny to millions of people any hope of normal economic betterment. We should try to understand Russia's conviction that she is entitled immediately to reimburse herself for her war losses by drawing upon the German industrial establishment that still exists. It will help to resolve our differences if we separate in our thinking steps that require permanent controls from those which are merely temporary expedients.

Neither of us will be forwarding our ultimate and common objectives if we impose controls that blight the development of so large and important a segment of the world as continental Europe. In such a blight lies the germ of a Third World War.



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ENGINEERING AND MINING JOURNAL

November, 1945

Administration Stockpile Bill Is Unsatisfactory

CONGRESS is virtually committed to the principle of stockpiling strategic materials as a safeguard to national defense. This was evident in the provisions covering the handling of such materials in the Surplus Property Act of 1944 and in the instructions contained therein to the Army and Navy Munitions Board to recommend materials and amounts to be stockpiled. However, the 1944 legislation was temporary in character and contemplated passage of permanent stockpiling legislation before Jan. 2, 1946.

Last spring legislation was introduced (*E.&M.J.*, April, p. 121) undertaking to carry out the will of Congress in establishing stockpiling policy. It called for a stockpile board, chairmanned by the Secretary of War and including the secretaries of the Navy, Interior, and State. The minerals stockpiled and the amounts were to be determined by the Army and Navy Munitions Board. To insure preservation of the stockpiles for the purposes intended, and to prevent demoralization of the mining industry by Executive use of disposal power as a political weapon, the bill provided that disposal of stockpiled inventories could only be made because of technological obsolescence with six months' notice to Congress, or by direct Congressional authority. This bill has been lying on the table in committee primarily because of the opposition of certain departments, notably Interior and State.

Now, after much interdepartmental discussion, the Administration offers a new stockpiling bill (S-1481), essentially different from the other (S-752) because: (1) It introduces a chairman "to be appointed by the head of the designated agency with the approval of the President" ("designated agency" is an ambiguous term apparently referring to whatever Executive agencies the President chooses to handle stockpile affairs). (2) It adds the secretaries of Agriculture and the Treasury to the proposed stockpile board. (3) It leaves the Army and Navy Munitions Board entirely out of the picture. The materials and amounts stockpiled are entirely up to the President and may be revised at will. (4) Disposal of materials no longer considered appropriate for stockpiling is left entirely to Executive discretion. The only safeguard against some future administration disposing of the stockpiles or using the disposal power as a club over the heads of producers is a proviso requiring publication in the Federal Register of intent to dispose, and the following: "The plan and date of disposition shall be fixed with due regard to the protection of the United States against avoidable loss on the sale or transfer of the material to be released, and the protection of producers, processors, and consumers against avoidable disruption of their usual markets."

We acknowledge, first of all, that the mining industry cannot expect serious consideration of any views aimed at making the stockpiling program a subsidy for mining activity. Stockpiling is a military precaution, and should be approached in that light. However, our industry does have a right to expect adequate safeguards against the injudicious dumping of surpluses into its markets.

On the other hand, it is certainly against the public interest to permit non-military departments to make a football of the stockpile program. A safeguard to the national defense should not be permitted to become part of the State Department's sales kit for making bargains with foreign nations. Nor should it become a foil for the ambitious bureaucrats in the Interior Department who seek control over basic resources and industries.

By padding the proposed stockpiling board with additional cabinet officers whose primary responsibilities are not national defense, and by eliminating the Secretary of War as chairman, the unfortunate effect is to reduce the control of the military departments over stockpiling.

Under the proposed set-up the whole program and its chairman could easily fall into the clutches of the politics-ridden Interior Department and its power-hungry schemers. This, in our opinion, would be a national calamity. We think the chairman of the stockpile board should be the Secretary of War or appointed by him or the President subject to Senate approval. We believe that the Army and Navy Munitions Board should have the responsibility of determining what materials and amounts are to be stockpiled, and that the participation of departments outside the Army and Navy should be advisory, not authoritative. Lastly,

we believe that the mining industry should be protected against Executive caprice by retention of the proviso in S-752 calling for submission to Congress of any contemplated disposal action.

We Wrote a Comment on Labor...

IT WOULD BE AS NATURAL as voting Democratic in Mississippi to write a strong condemnation of the current excesses of certain labor organizations. Because our readership is essentially in management, we could be assured of widespread approbation, particularly from people who ask no more of industry journalism than flattery of their prejudices.

Mindful of our ethical responsibility, one of our editors still believed that the conduct of some labor organizations merited vigorous censure. He believed that the mining industry, its labor included, would be served by sharp criticism of the excesses in the present picture. Accordingly, he wrote an editorial, bristling with adjectives, representing his views that labor is fouling its own nest.

Believing that it can serve its readers best by serving the whole mining industry and not selected factions, *E.&M.J.* has no desire to identify itself as a champion of mining management against the men who work in mines. Therefore, the proposed editorial was passed around for comment.

One member of our staff, having at one time been identified with the labor movement, is more tolerant of labor's side of the picture than most of us. He was sufficiently exercised over the views expressed in the proposed editorial that his comments amounted to an editorial of equal eloquence. Believing that many of his points have merit, we set them down in skeleton form, opposite a condensation of views expressed in the original piece. Let the reader pick the best from each, but not throw either overboard as written in haste or lacking full sincerity.

Labor Rocks the Boat

1. Excesses like those of Lewis and Petrillo injure and discredit the labor movement.
2. Some labor organizations are asking a pure gratuity—the inflated take-home wages of wartime for less work and less production.
3. The home front record of profits, work stoppages, and personal inefficiency is in disgraceful contrast to the sacrifices of enlisted personnel.
4. Labor organizations have resisted or contributed little to our marvelous productivity, essentially the result of technological progress, individual contributions and high investment per worker.
5. The public welfare and employment of servicemen depends on quick conversion to maximum low-cost production. Higher costs will react more unfavorably on labor than on management.
6. Labor's reduced purchasing power is still slightly better than prewar. Nobody else's is as good.
7. It would be more appropriate to wait for some evidence of profit than to hold up reconversion over anticipated profits.
8. Because some labor organizations show such disregard of the public interest, their extraordinary prerogatives should be canceled. They should be held strictly accountable for their parts in personal assaults and destruction of property. Like all other groups they should be subject to anti-trust and anti-racket legislation. They should be prevented from levying private taxes or blocking technological progress.

What Constitutes "Partnership"?

1. Because labor is "rocking the boat" is no justification for intensifying the distrust which already exists. Labor simply does not trust management.
2. Acknowledging management's responsibility for the survival and efficiency of the enterprise, labor believes it has a right to know all the facts concerning earnings and disbursements, and to participation in profits.
3. Those whose efforts are so indispensable to production have a right to representation on directive bodies.
4. Management's record of force, influence of the press, and bribery is nothing to brag about. Considering its traditional access to talent and education, its failure to do right when it had the upper hand inspires no confidence.
5. Management is just as uncompromising as labor, when arbitration is not to its advantage.
6. Labor will never be reconciled to anybody's holding a job where compensation is disproportionate to services rendered, simply because the beneficiary represents some owner interest.
7. The prestige of the President and his Administration is behind the contention that business can pay higher wages and still profit.
8. The best interests of management and capital are linked to the highest wages they can afford. Their outstanding market opportunity is maximum purchasing power in labor's hands.

Both sides to this friendly controversy agree that mining (except coal) labor organizations maintained a better-than-average record during the war and are entitled to recognition that they are not participating in the present hold-up of the reconversion stage. We earnestly hope that this and the no-strike, no-lockout provisions of the recent Coeur d'Alene agreement (p. 110) are evidence of realization that labor cannot truly profit by wrecking the industry of which it is part. We hope that mining labor and its representatives will recognize the multifold economic problems

facing our industry as problems in which they have a vital interest. We also hope that by willingness to settle differences through reason rather than force, they will deserve what every thoughtful citizen wants them to have—the best wages and working conditions that the industry can afford.

Trust Busting or Persecution?

TARGET FOR THE TRUST BUSTERS for more than three and a half decades, the Aluminum Company of America during much of this period has nevertheless been quietly rendering an important service to the nation, without which the war now over might have had a different outcome. It was fortunate indeed that when the demand for aluminum and its alloys for wartime aviation purposes leaped to fantastic figures, the company had already done much of the research without which the alloys wanted for plane construction would not have been available.

This work of Alcoa began in 1916, when the Government, on learning that Germany had developed a hard alloy of aluminum—duralumin—asked the company to try to produce a similar alloy for use in building airships. Entry of the United States into the war in 1917 interrupted the work, the company's capacity being required for other purposes that were more pressing at the time. Subsequently it was resumed.

The research thus undertaken has throughout been paid for out of Alcoa's pocket. In 1928, by which time aluminum had come to be used to a limited extent in airplanes, the quantity amounting in that year to 770 lb. per plane for the 4,800 planes produced, the company spent $96,000 for research in the aviation field. Nine years later, when the aluminum used per plane averaged 5,800 lb., the money spent for corresponding research was almost $350,000, and in the first year after Pearl Harbor, when more than a billion pounds of the light metal went into airplanes, the company's expenditure for research in the aviation field was $829,000. The Armed Services were content to leave this important matter to the company.

In contrast, aluminum research in Europe from the time of World War I was subsidized directly or indirectly by the governments of the respective countries as a means of promoting military security. How great the dilemma of the War Production Board would have been after the Japs struck, had this experience and special knowledge of Alcoa, as well as its willingness to serve, been lacking.

The existence of Alcoa, with its technical "know-how" and its financial ability to engage in expensive research programs on short notice, has been an important asset to the nation during a critical period. In the light of the facts set forth, the long-continued effort of the Department of Justice to break Alcoa up into separate units to provide competition within the industry presents the curious spectacle of penalizing the benefactor for the very circumstances that have helped make his benefactions possible.

The zealous thinkers who have been touting anti-monopolism as a means of reducing costs to consumers disregard this principle, to favor competition for Alcoa. They would sell Government power at special rates or make extraordinary concessions in disposal of plants. They know Alcoa can produce aluminum cheaper than anyone else and are willing to gouge taxpayers to keep competition in the running.

It seems to us that the persecution is more vindictive than adherence to principle would warrant, and that its violence must spring from political motives.

MILLING AROUND

The complaint (p. 158) from Alaska at the attitude of the General Land Office is another straw indicating that the Congressional committees on Mines and Mining ought to make a searching investigation of the Interior Department.

Probably Mexican silver production will show no great jump as a result of the 26¢ price increase. Between the Mexican Government taking 14¢ of the increase (before income taxes) and the expected demands of labor, the most operators expect to net is a few cents.

Friends of *E.&M.J.* will be pleased to learn that the article, "A National Mineral Policy," published in the April issue, was awarded first prize in a national contest conducted by "Industrial Marketing" for " . . . the best single article or editorial published during the twelve months ending July 31, 1945, contributing to the advancement of the field served."

It is strongly rumored that the State Department has the stage set to make a 50 percent cut in the copper import tax, in the new Canadian treaty.

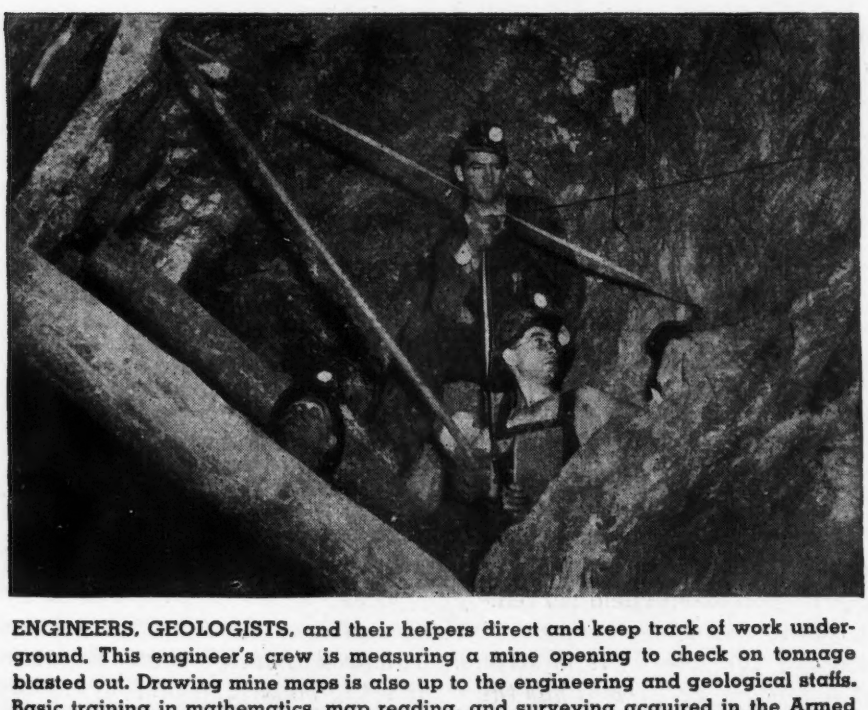
Take a Look at Mining—

Believing that opportunities and conditions of employment in the mining industry should be made clear to this country's young men, *E.&M.J.* has reprinted, and is now distributing through the U.S.E.S., this article in pamphlet form to interested veterans at all separation centers.

RIGHT ABOUT NOW there probably isn't room in your mind for anything but the wish that they'd hurry up and untangle the last of the red tape so you could get on home and get out of that uniform. After that there's a lot of home work you want to get caught up on, and you've probably got that all planned, too. Well, take your time and enjoy yourself.

But sooner or later you're going to begin thinking about a job. After you've seen all the people you want to see and done all the things you want to do, you'll need something to work at; something that will pay you well, and that you'll enjoy doing.

That's where we come in. We'd like to have you take this pamphlet along and keep it where you can find it. Then when you begin to look around in a few weeks and wonder "Now what," get this out, read it, and think it over. The mineral industries need men. In fact, the opportunities for the right men are better than they've been for twenty years. Maybe you're the right kind of man. If you are, there's a place for you in the mineral industries.



ENGINEERS, GEOLOGISTS, and their helpers direct and keep track of work underground. This engineer's crew is measuring a mine opening to check on tonnage blasted out. Drawing mine maps is also up to the engineering and geological staffs. Basic training in mathematics, map reading, and surveying acquired in the Armed Forces will be a valuable aid in this work.

Now then, if you have time enough to read this slowly and think about it, let's get on with the details. We'll just try to answer the questions you might ask if you were talking with us about a job as a miner or a mining engineer.

But before we start we want to make one thing clear. If you worked in the mining industry before you went into the Armed Forces, we are sure that your old company has a job for you. We have talked with a great many mining men on this point, and they have all said the same thing, "When our men are released by the Services, we want them back."

Mining is one industry where you won't need an Act of Congress and a court order to get your old job back or a better one. But better come back within 90 days from your discharge, just to be safe in regard to your legal rights as a veteran.

What Mining Is

Now if you haven't already worked in mining, the rest of this is for you. Let's start by clearing up what we are talking about.

We are speaking of the mining industries that supply all the minerals except coal and oil. The coal mines and oil fields may need men, too, but that's another story.

We are talking about the mines, mills, and smelters that supply copper, zinc, iron, gold, tungsten, uranium, molybdenum, manganese, silver, aluminum, magnesium, lead, and the other metals. Also, we speak for the mines and plants that supply phosphate rock, sulphur, salt, pot-

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ash, fluorspar, gypsum, barite, asbestos, talc, and a dozen other non-metallic minerals.

This industry did a billion-dollar business in 1937, and it will do better in the next few years. Think this over. In 1937 business was pretty good, but nobody was exactly lining up to buy cars, golf clubs, washing machines, or radios. Well, prospective buyers are in the market now. Right from big corporations that want tons of new machinery down to little girls who want bobbie pins, everybody in the country wants to buy something.

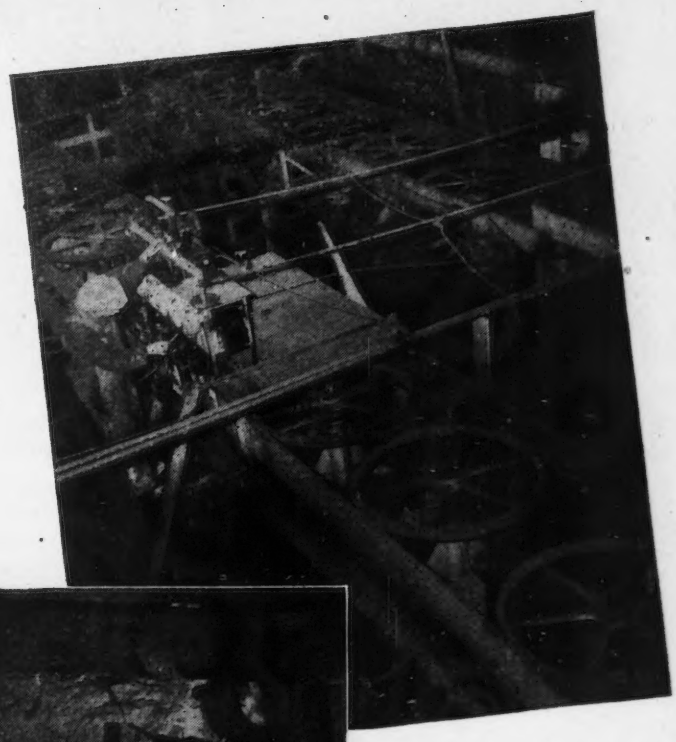
And practically every last thing they want to buy is made of metal, is made by metallic tools, or uses one or more of the non-metals.

Mining worked overtime to furnish the metal that went into B-29's, M-1 rifles, aircraft carriers, jeeps, atomic bombs — every weapon the Army and Navy has. Now mining will be working at capacity to furnish the metal that will go into houses, railroad cars, telephone cables, convertible coupes, roller skates, and lipstick cases. There is a big job to do, all right.

Men Wanted

So the question comes up as to who's going to be on hand to do that job. Here's how things stand.

Mining, like everything else, took an awful wallop in the depression. Employment in metal and non-metallic mining dropped from 120,000 in 1929 to 49,000 in 1932, and then crept up to 115,000 in 1937, dropped to 102,600 in 1938, and got back up to 115,000 in 1942. After that, wartime demands reduced manpower steadily until today somewhere around 60,000 men are at work in this field. Employment of an additional 40,000 to 50,000 men in metallurgical plants, smelters, and auxiliary works fluctuated correspondingly.



MILLMEN run machines that recover good mineral from waste rock. Flotation operator above adjusts chemicals in copper mill.

•

ROCK DRILLING is primary mining step. Men at left drill in a mine drift with work-saving "jumbo" machine. Other miners run ore loaders, set timber, sink shafts, hang pipe, run motors.

•

SMELTING PLANTS produce the metal. Smelterman watches machine for casting copper. Steam is from hot metal.

Black Hills Studios, Inc.

YOU'LL ENJOY living in a mining town if you like outdoor life. Good fishing and hunting country surrounds this gold mining camp in the West.

Just because there will be a big demand for minerals, it doesn't necessarily follow that more men will be working than ever before. Machines are doing a lot of things now that men used to do, but if there are fewer jobs, they are easier and better jobs. It is certain that metal mines are short-handed, and that somewhere around 60,000 jobs in the mining field are looking for men to fill them.

Opportunity Knocks

The opportunities for young men are especially good right now. Ordinarily a new crop of young men enters the mining business each year, some as engineering students and some as apprentices who want to learn mining by doing it. But during the depression, from 1930 on, this crop of new men was pretty thin, and during the war years, there hasn't been any crop at all. Mining, you see, has a replacement problem. Most of all the industry needs technical men.

Therefore, we tell you with no hesitation whatever that if you want to go to college, and if you have what it takes to be an engineer, the best opportunity in many years is now open to you as a student of mining or metallurgical engineering or geology. Or if you want to go directly into a mine or smelter and learn the business from the ground up, mining companies are now in a better position to help you with training courses and good supervision than they have ever been before.

The pictures on these pages show you mining men at work, and they'll give you some idea of what jobs there are. What we hope to do is show you the *kind* of work—not all the details of each job.

From the pictures you can see that there are about five main kinds of work in mining: (1) finding the ore

Photo courtesy Battelle Memorial Institute

RESEARCH is increasingly important to mining. Treating impure ores or producing new alloy metals demands best of scientific skill. Researchers here study tin ore.

deposits; (2) breaking out the ore; (3) milling the ore to make it higher grade; (4) smelting the ore to make the metal; (5) doing the accessory jobs like repair work, construction, and bookkeeping.

Finding the ore is likely to be a rugged job, but it is also very satisfying if you like an outdoor life. A prospector prowls around the hills looking for signs of mineral that the other fellow missed. Anybody can be a prospector if he knows minerals and how they ought to be mined—and if he can stand his own cooking. A change is taking place in prospecting methods, though. Most of the easy finds have been made, except in remote places, and much of the ore finding of the future will be a scientific game calling for well-trained specialists.

Mining the ore usually means the hardest work. Setting up drills or mine timbers isn't easy, but a man still has to use his head as well as his muscles. Work underground is often muddy and sometimes it gets pretty rough, but it is no more dangerous than any other job where you handle heavy tools, dynamite, or construction equipment.

Why do men do it? Because hard-rock miners are paid well, and because there's a kick to it. A good miner is a skilled craftsman, and he takes pride in his work. Many Western miners also do it because they some day intend to start work on a little claim of their own and what they learn now will come in handy then. Mining, you see, still has room for men who want to run their own show.

Milling the ore takes more skill than strength. Ore from the mine is delivered to the mill where processes of several different kinds are used to build up the grade of the ore. Millmen run these processes; they decide how much of certain chemicals to add; they keep the machines running properly; they take samples and analyze them; they do everything they can think of to get more gold or copper, or whatever the metal is, out of the ore. This is a particularly good field for young technical men, because it is constantly growing and becoming more important.

In smelters a man works around big furnaces of one kind or another. Concentrated ore from a mill is melted down and converted into metal and a waste product. A smelterman may get hot when he works, and he gets dirty, but he doesn't get bored. Smelters are greatly in need of technical men right now to help figure out how to handle impure ores, and they need men with backbone to learn how to run the furnaces.

Doing repair work for a mining company isn't like working in a garage. Every day brings something different into the shop, and if a man can think up a better way to handle a job, he'll be welcome in a mine shop. Carpenters, blacksmiths, welders, plumbers, electricians, machinists, toolmakers—all are needed by mining companies for work of a kind that keeps a man interested.

Research Demanded

There is another branch of mining that covers all the others, and that is research. This is about the most important one for the really live-wire students of mining engineering. From now on, young men with technical training are going to be put to work even more frequently investigating everything around the mine and smelter to see if things can't be done easier, cheaper, and better. In no other field of engineering is the opportunity so great for research of this kind, mainly because so little has ever been done, except by a few companies. Research for mining companies in chemistry, physics, mining methods, metallurgy, and industrial methods will have to be done on a large scale, and it will take the best kind of scientific brains to do it. Young men with fresh ideas, energy, and scientific training are needed and wanted in this branch.

Placer mining for gold is an occupation all by itself, which is why we

MAINTENANCE CREWS, at left, handle heavy mill and smelter machinery, do big repair jobs. Sampler in center cuts rock from face of mine working; sample is analyzed to check value of ore. This is first job many young engineers get. Burner, at right, cutting rivets on kiln, is only one of many skilled tradesmen needed in mining. Dozens of skills such as rigging, welding, mechanical and electrical repair acquired in the Services will come in handy for jobs like these.

mention it separately. You simply dig gravel, then wash it. Anyone with energy, brains, and a liking for outdoor life can learn small-scale placer mining rapidly, and it is still possible for a few good men to get together on a gold placer proposition in Alaska, for example, and make themselves some money. But remember that it takes hard work, and a good knowledge of the country and of simple placer mining methods.

Placer mining also includes the operation of big gold dredges, most of which now are found in the Western United States, Canada, Alaska, South America, the Philippines, and Australia. To be a dredgeman you need only some acquaintance with machinery and a willingness to work. You start in young as an oiler and learn the business, gradually working up to be a winchman, who controls the dredge, or a dredgemaster, who runs it. Salaries and wages are good; winchmen get up to around $250 a month for foreign jobs and dredgemasters around $350. Dredging takes skill and hard work, but it is work that can be fun, too.

Adventure in Mining

There is one side of mining that we have not yet brought up, even though it is the thing nearly everybody thinks about when you mention mining, especially for gold. That is the adventure of mining: the fact that mining isn't a cut-and-dried affair, and that even the best mining proposition is still a bit of a gamble.

We don't want you to think that mining is still the rip-roaring hell-bending side-show they tell us it was in the early days in Leadville or Goldfield. The miner is pretty much of a law-abiding citizen these days, but because of the element of luck in mining, and because the work itself is tough enough to carry a kick, living and working in a mining camp will keep your blood circulating as fast as you'll ever want it to.

You Can Travel

And don't forget that if you like to travel, you can do so in mining. Most mining men are familiar with a good part of the United States and the world, too. Airplanes have opened up a number of mining camps that could never have been reached otherwise, and mining men in Alaska, Canada, and South and Central America are now using airplanes the same as they do taxis in town.

Now, that is the kind of work mining men do. What they get paid for doing it is shown in a table on the next page. These wages and salaries are not war-plant pay. They have not been raised sky-high because of the war, and they will not be cut sharply because the war is over. No one is smart enough to say for sure whether these wages will go up or down in the future, but we do think that foremen, shift bosses, and young engineers are going to get better pay from now on. Mining needs good men in these jobs, and it can't afford to underpay them.

We have said a lot about opportunities in mining, especially for young engineers. It is a fact that every mine in the country needs young technical men and needs them badly. We believe sincerely that in no other profession can the right sort of young man get ahead so fast as he can from now on in the mining field.

There is an "if" to this, however. A young man can do it, if he knows his basic engineering thoroughly, is eager to learn, and is willing to work. Don't ever say we told anyone that mining is a bed of roses, because we are saying right now that it isn't. You ask for work when you sign on at a mine, and you get it. But what we do say is that you'll get a better break in return for your work than you will in most any other industry or profession.

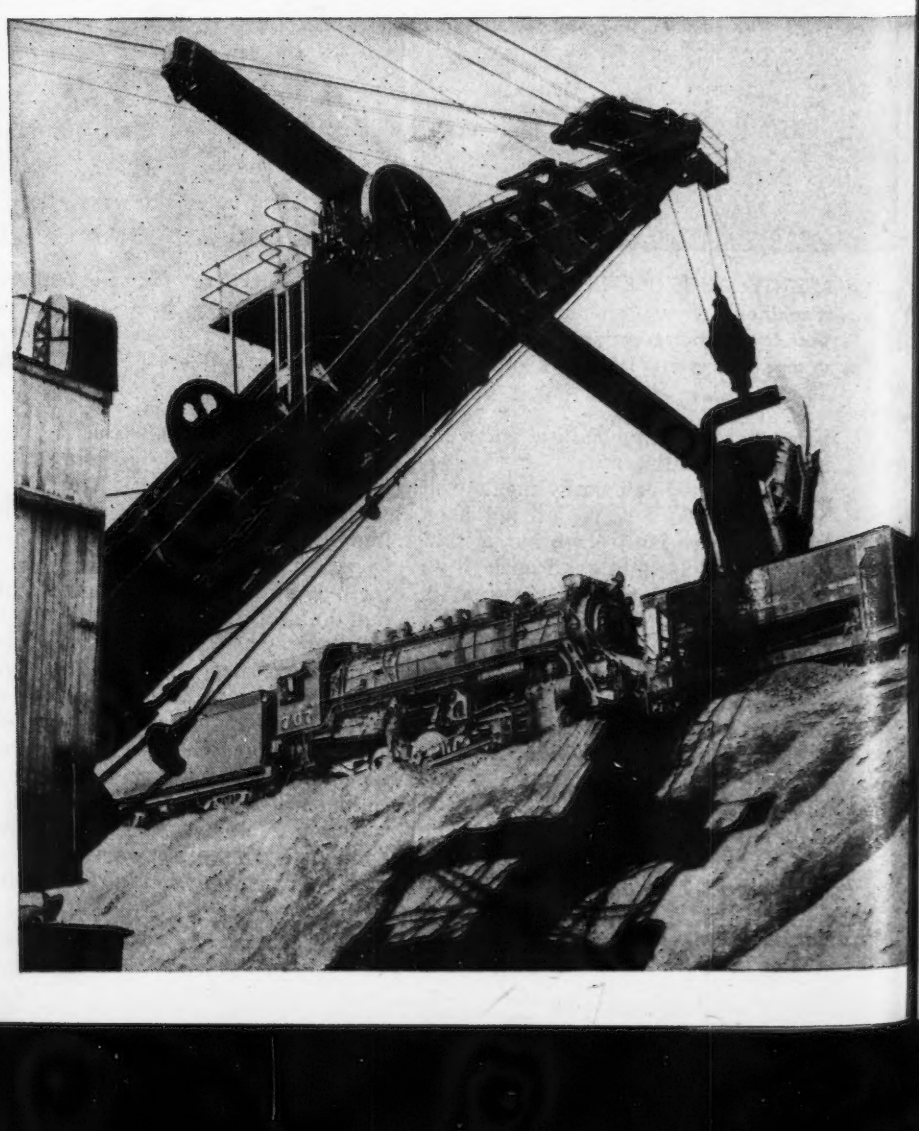
Where Are the Mines?

Mining is not something that goes on only "out West." A great deal of mining is done in the West, of course, but there are mines spread all over the United States. There

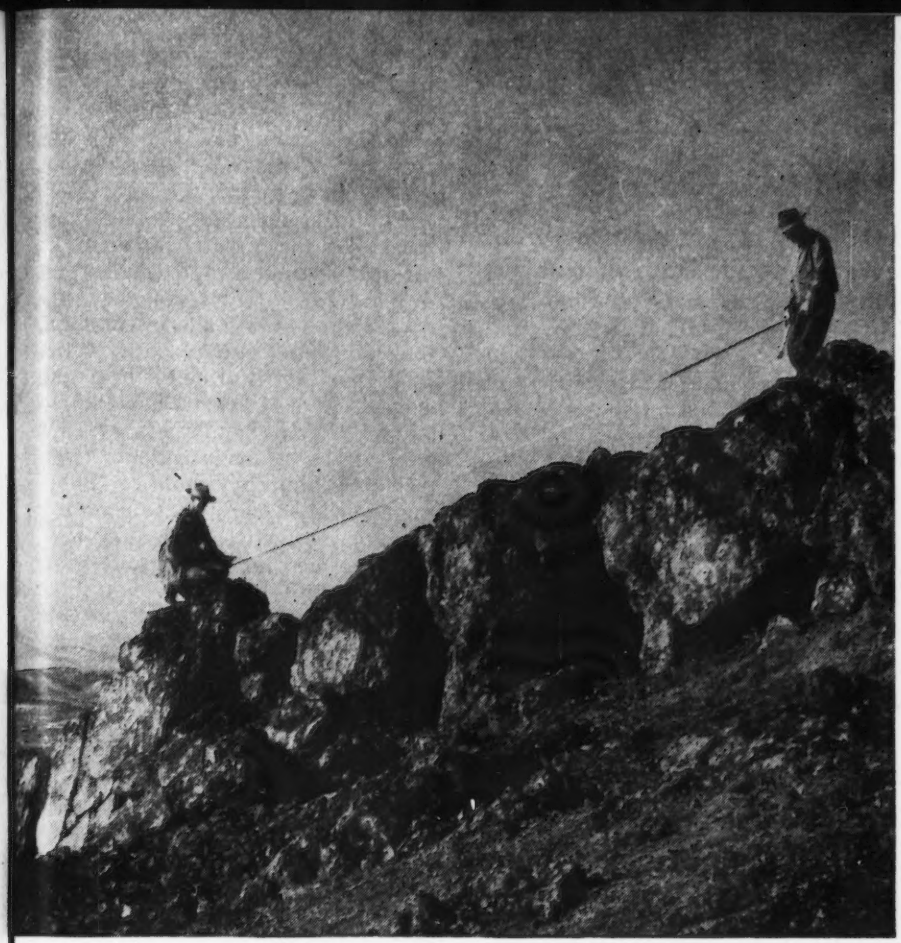
HOW TO GET STARTED

See a Veterans' Administration office, the U.S.E.S., or any school listed on the last page. If you were 25 years old or less when inducted, and have served 90 days or more, the G. I. Bill offers you up to $500 per year for college tuition plus an allowance for living expenses. Do this if you want technical training.

You can also learn mining as an apprentice with any mining company that runs an approved training program. The government then pays you $50 per month, if single, $75, if married, while you learn.



OPEN-PIT MINES use heavy earth-moving equipment. Jobs here are for shovel operators, oilers, bulldozer operators, truck drivers, train men, drill runners. Servicemen who operated heavy machinery in military construction projects will feel at home with this equipment.



PROSPECTING becomes more complicated each year because orebodies left are harder to find. These geologists are mapping a ledge of rock that may be the outcrop of a vein of ore. This work will appeal to the adventurous young man.

are several important iron and zinc mines almost within sight of New York City, for example, and many of the gold mines in California are only two or three hours' drive from San Francisco. In most of the country's mining camps, a good-sized city like Denver, Salt Lake City, Butte, Phoenix, Minneapolis, and others is near enough to drive to for a week-end.

Where Do Miners Live?

Living conditions in mining camps depend a good deal on the mine. Up in Butte, Montana, for example, the men who work for Anaconda Copper Mining Co. live in town. Butte has about 40,000 people ordinarily, and living there is just the same in every way as living in any other town that size. Except that you have a lot more fun in Butte.

In a place like Morenci, Arizona, where Phelps Dodge Corporation has a mine, mill, and smelter, all activity there depends on the company, and for that reason there are few people there who do not work for the company. The company provides many of the houses, runs the store, and arranges and supports in part things like movies, baseball, bowling, dancing, and general clubhouse activities. Despite these things, people in more remote camps like this one are dependent very largely on one another for amusement. The right sort of person likes it that way; the wrong sort of person can't stand it.

Single men in mining camps are usually taken care of in boarding houses and dormitories run by the company. We have eaten in enough mine boarding houses to know that the food is good and comes in big quantities.

Men with families are given houses in the remote camps, or the company will help in finding a house if the mine is near town. Living costs are neither higher nor lower than they are anywhere else, although in the long run people probably live cheaper in most company towns.

Both single and family men will find that mining companies that engage them are going to take good care of them. Mine managements want good men to work for them, and you can't get good men without making things attractive. With all the improvements there are today a man and his family do not have to sacrifice comfort to work in a mining camp. Mining companies

Wages and Salaries in Mining

The following wages per 8-hour shift show the approximate range for such jobs throughout the country. Cost of living is usually higher where wages are higher. Advancement, for the present at least, is rapid.

MINE	
Miner	$7.00 to $ 8.75
Timberman	7.50 to 8.75
Mucking machine man	7.25 to 8.50
Shaft repairman	8.00 to 9.25
MILL	
Flotation operator	$7.25 to $ 8.75
Mill helper	6.75 to 7.75
Sampler	6.75 to 8.00
SMELTER	
Furnace tender	$7.25 to $ 8.75
Metal casting	7.00 to 8.00
Craneman	7.50 to 8.75
Plant labor	7.00 to 7.75
Clean-up labor	6.75 to 7.50
MECHANICAL DEPARTMENT	
Mechanic, first class	$8.00 to $ 9.00
Blacksmith	7.75 to 9.00
Mechanics' helpers	7.00 to 8.25
Welders	7.75 to 9.00
Carpenters	7.75 to 9.00
Truck drivers	7.50 to 8.50
Cat skinners	8.00 to 9.00

Most mines have incentive systems which permit workers to earn wages considerably higher in return for efficient production than those shown.

The following monthly salaries are being offered at present:

	Domestic	Foreign
MINE		
Shift boss	$250 to $ 300	$275 to $ 350
Engineer, no exp.	175 to 225	200 to 250
Engr., asst.	200 to 325	250 to 350
Engineer	250 to 450	400 to 600
Supt.	300 to 400	350 to 600
Manager	500 to 1,000	500 to 1,000
MILL		
Metalgst.	$200 to $ 300	$250 to $ 350
Asst. Supt.	250 to 350	300 to 400
Supt.	300 to 450	350 to 600
SMELTER		
Metalgst.	$250 to $ 400	$300 to $ 500
Supt.	500 to 800	450 to 850
Research metlst.	300 to 400	350 to 450
Physical metlst.	400 to 600	
Geologist	200 to 450	225 to 500
Assayer	175 to 250	225 to 275
Master mech.	250 to 450	350 to 600

will do their best to keep their employees comfortable.

Just a word about foreign mines. Men from the United States are working in mines all over the face of the earth; and if you want work in mining, foreign work may appeal to you.

Suppose you sign a contract for two or three years in a South American mining camp. You'll be paid more than you would at home, and you will save a lot of money down there because there will be no place to spend it. The company usually sends you there and back, pays your expenses, and provides good quarters for you and your family if you have one. On a salary of say $200 a month a young fellow, single, could save about $150 and still have all the fun he could handle.

Foreign Jobs

You learn to run mining operations faster in foreign camps than you do in the States, because you usually have someone else doing the hard work while you stand by and give the directions. Job openings come oftener, and if you have the stuff to step up into a better job, you'll have a chance at it. Good men are greatly in demand for foreign jobs at almost any time. People who like a good deal of freedom in the way they work and live, can usually find it in foreign work.

But you must make up your mind to this: If you want to come home again your foreign experience won't help you as much as you think it should in getting a job in the States. You may have been a mine superintendent at 28 in South America, but you'll probably be pushing 38 before you get a similar job up here.

Miners Are Builders

All the while we've been working on this we have tried to put together in our minds a picture of what a typical mining man is like, the idea being to help you decide whether or not you'd fit into the profession. Well, the fact is that there just isn't a typical mining man.

They are tall or short, fat or thin, lazy or hard-working, just like the rest of the human race. There is nothing on a mining man's face or clothes to tell you how he earns his living, except that you'd never mistake him for a ribbon clerk. Mining men can handle themselves well in most any situation that comes up, and they look it. But a lot of other people look capable too.

Mining Schools

Directory of Schools in the United States Offering Training in Mining, Metallurgical, or Geological Engineering

University of Alabama, University, Ala.
University of Alaska, College, Alaska.
University of Arizona, Tucson, Ariz.
Stanford University, Palo Alto, Calif.
University of California, Berkeley, Calif.
Colorado School of Mines, Golden, Colo.
Yale University, New Haven, Conn.
University of Idaho, Moscow, Idaho.
University of Illinois, Urbana, Ill.
Purdue University, West Lafayette, Ind.
University of Notre Dame, Notre Dame, Ind.
Iowa State College, Ames, Iowa
University of Kansas, Lawrence, Kan.
University of Kentucky, Lexington, Ky.
Harvard University, Cambridge, Mass.
Massachusetts Institute of Technology, Cambridge, Mass.
Michigan College of Mining and Technology, Houghton, Mich.
University of Michigan, Ann Arbor, Mich.
University of Minnesota, Minneapolis, Minn.
Missouri School of Mines and Metallurgy, Rolla, Mo.
Montana School of Mines, Butte, Mont.
University of Nevada, Reno, Nev.
Princeton University, Princeton, N. J.
New Mexico School of Mines, Socorro, N. M.
Columbia University, New York, N. Y.
Rensselaer Polytechnic Institute, Troy, N. Y.
North Carolina State College, Raleigh, N. C.
University of North Dakota, Grand Forks, N. D.
Case School of Applied Science, Cleveland, Ohio
Ohio State University, Columbus, Ohio
Carnegie Institute of Technology, Pittsburgh, Pa.
Lafayette College, Easton, Pa.
Lehigh University, Bethlehem, Pa.
Pennsylvania State College, State College, Pa.
University of Pittsburgh, Pittsburgh, Pa.
South Dakota School of Mines Rapid City, S. D.
University of Texas, El Paso, Texas
University of Utah, Salt Lake City, Utah.
Virginia Polytechnic Institute, Blacksburg, Va.
State College of Washington, Pullman, Wash.
University of Washington, Seattle, Wash.
West Virginia University, Morgantown, W. Va.
Wisconsin Institute of Technology, Platteville, Wis.
University of Wisconsin, Madison, Wis.

No, if mining men are alike in anything, it must be deeper than looks or size. We know a very great many mining men and we like all of them. We have watched them at work, from muckers to managers, for many years, and we know of only one thing they all have in common. They all would rather build something than buy it or sell it or argue about it as a lawyer. They like to use their hands, and there are not many mine superintendents who don't still think they could go underground and show any of their miners a thing or two with a rock drill.

Mining men thrive on tough jobs. They like problems they can solve with drill steel and dynamite, a new mill flowsheet, or a better furnace charge. Mining men take pride in producing wealth right out of the ground, without trampling over someone else to make a living.

What does all this mean to you? Well, if you like to travel, if you don't mind working hard as long as you are building something or producing something, if you like to work with tools or machinery, if an outdoor life appeals to you, if you want work with a kick to it, or if you'd like to do research work, then you have a right to take very seriously the things we have told you.

But, you may say, construction men, oil and gas men, chemical plant men, all the several kinds of engineers like to build things too. If I like to use my hands as well as my head, why should I pick mining instead of chemical or electrical work?

Mining Is Uncrowded

Because mining is an uncrowded field, because mining is the foundation of all the others, and because mining men make use of all the others in their own work. Mining is the only branch of engineering that uses all the other branches in order to get the job done right. Chemical, electrical, mechanical, aircraft, civil, construction — every kind of engineering you can think of—must play its part in the mining industry. That is why mining can offer young men a variety of employment and a breadth of opportunity that no other engineering profession can match.

Therefore, if what we have said interests you, and if you think you're the right kind of man, why don't you investigate further to see exactly what sort of opportunity mining may have for *you?* See the nearest U. S. Employment Service office, or write to the registrar of any of the mining schools listed on this page.

What Caused Foreign Silver to Jump to 71.111c.

H. H. WANDERS,
Market Editor

WHEN THE WAR PRODUCTION BOARD, late in August, revoked its restrictions limiting the use of foreign silver, consumers who had been unable to purchase this low-priced metal in the war period rushed into the market for substantial quantities. The demand was so great that the available supply of free metal could have been disposed of in no time at all.

Complicating matters further, consumers of silver outside of the United States were actively bidding for silver, and, where competitive conditions prevailed, they were in a position to raise their buying limits to well above the 45c. ceiling imposed by OPA on the United States market. It was common knowledge that foreign consumers were paying 60c. and more an ounce. It soon became apparent that a ceiling fixed here at a point below the world price would stop the flow to this market.

What to do, was OPA's problem. Producers were consulted, and consumers questioned. Early in September it was rumored that something would be done to remove the discrepancy in prices. Trade in foreign silver in this market under such conditions dried up. By the middle of September, it was generally known that the price would rise, perhaps substantially. Effective Sept. 21, OPA established a new ceiling for foreign silver at 71.111c. a fine ounce.

The Office of Price Administration had been in a few tough spots with silver on prior occasions. Those familiar with silver will recall that the price of foreign metal troubled OPA early in the war period. Demand for the metal at the Treasury's supporting level of 35c. attained such proportions in 1942 that OPA was forced to take notice and establish its first ceiling at 35.375c. a fine ounce. This became official on Aug. 10, 1942. The reason stated officially was to control "serious inflationary pressure."

Then another event occurred to disturb OPA. Before August 1942 ended, the United States and Mexico entered into an agreement to increase the price to 45c., to encourage production and aid in various ways to strengthen countries benefited financially. Without mentioning "serious inflationary pressure," OPA, on Aug. 31, same year, raised the ceiling on foreign silver to the basis of 45c. This ceiling held until recently, when pressure from that old economic law of supply and demand raised the ceiling to the equivalent of the domestic price, established at 71.111c. by the Treasury on July 1, 1939.

The activity that forced the price of foreign silver to rise sharply resulted from natural reasons. WPB's action eliminating its controls on silver came suddenly. Consumers, who up to Aug. 20 were forced to satisfy their needs with higher-priced domestic metal, were hungry for 45c. foreign silver. Sellers were startled by the quantities sought. Demand for silverware, for instance, has been brisk, a not unusual condition in a period of free and easy money. On the other hand, stocks of silverware, including jewelry, were abnormally low. Manufacturers were eager to take full advantage of this favorable situation. Industrial consumers, also convinced that demand for silver and silver-bearing products would remain at a high level, in spite of war cancellations, were out to replenish their stocks. On top of this extraordinary demand for silver, the industry was well aware that use of the metal for monetary purposes has been increasing sharply. Whether the heavy demands for silver are likely to continue over an extended period is a question that is puzzling producers as well as consumers.

Senator McCarran's recent suggestion that the domestic price be raised to its full monetary value of $1.29 an ounce has not passed unnoticed in silver circles. After witnessing the rise in foreign silver from 45c. to 71.111c., anything is viewed as possible.

There are those in the market who feel that the 71.111c. basis cannot last should foreign holders of silver decide that they would rather exchange metal for dollars.

Output of silver will be stimulated if producers are permitted to retain at least a fair share of the higher selling basis with which to meet rising costs. As soon as the new price was posted, officials in countries that produce silver in quantity began to increase taxes on silver, and labor moved with equal speed to obtain a larger cut from the proceeds.

Industrial Use of Silver in U. S During 1943
(War Production Board)

	Troy Ounces
Solder and brazing alloys	14,932,000
Photographic goods	17,370,000
Contacts	7,903,000
Misc. electrical products	5,282,000
Insignia	8,902,000
Dental supplies	1,283,000
Pharmaceuticals	392,000
Jewelry	20,424,000
Silverware	18,792,000
Misc., including bearings	22,614,000
Total	117,894,000

Silver in Coinage

The U. S. Mint reports that 75,409,000 oz. of silver was used in this country for coinage purposes in 1944. The annual average for 1936 to 1940 was 17,790,000 oz.

Silver Production

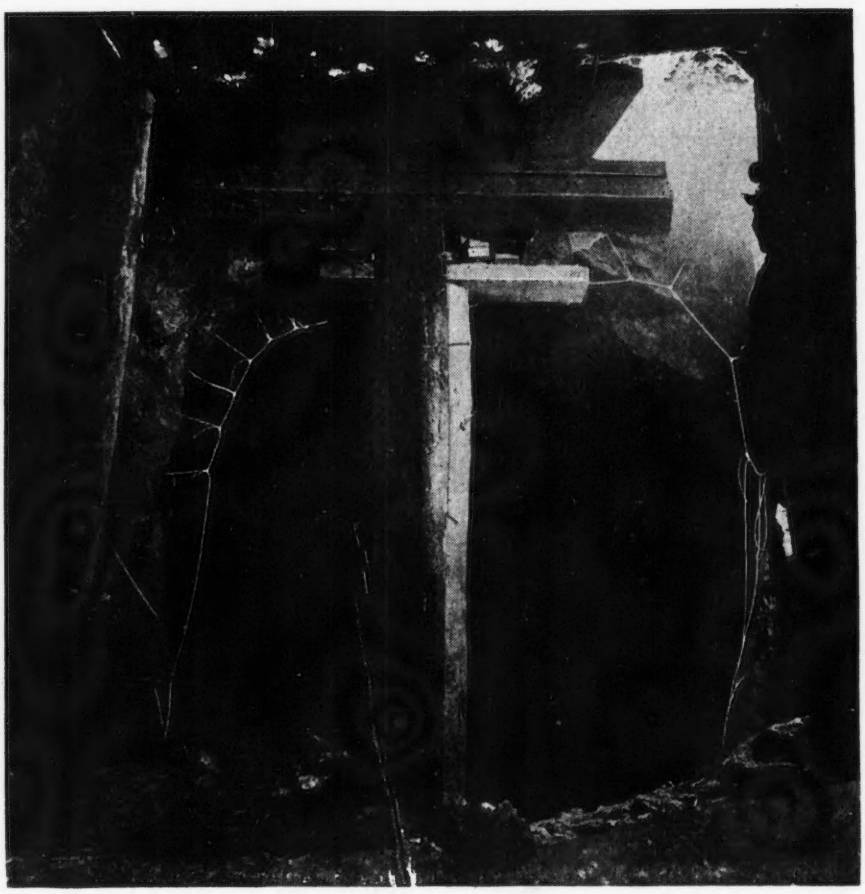
World production of silver in 1939 was estimated at 257,907,755 oz. World production statistics for the war period are not available. Production of silver in North and South America in 1943 and 1944, according to the American Bureau of Metal Statistics, in fine ounces, was as follows:

	1943	1944
United States	44,812,000	37,370,000
Canada	17,344,569	13,545,905
Mexico	71,200,000	63,000,000
Newfoundland	1,258,708	1,163,000
Central America, etc.	3,586,000	4,000,000
Argentina	2,168,000	1,695,000
Bolivia	7,299,561	6,797,378
Chile	1,006,681	950,000
Colombia	209,950	205,000
Ecuador	300,748	325,000
Peru	14,659,744	11,650,000
Other South America	100,000	100,000

Long-Hole Leyner Drilling Speeds Stope Preparation

LONG-HOLE LEYNER DRILLING plays an important part in the preparation of stope undercuts at the property of National Tunnel & Mines Co., about 4 miles south of Tooele, Utah. Low-grade orebodies currently under exploitation occur in garnetized areas within the Yampa limestone below the 2,600 level, with operations carried on chiefly through the 24,000-ft. Elton tunnel. Most minable areas are irregular in shape, requiring careful preparation work. Openings larger than 8x8 ft. are timbered, as the garnet in which the ore occurs is structurally weak. Principal production area is along the Yampa footwall, where the orebody is about 800 ft. long and the average minable width 40 ft.

Developed ore is mined by a sublevel method of stoping adapted to the present labor shortage. Through it, and the employment of long-hole drill work and Primacord, preparatory work has been reduced 60 percent.



PRIMACORD connecting a ring of blast holes all set for detonation. Rings are drilled at 5½ to 6 ft. intervals.

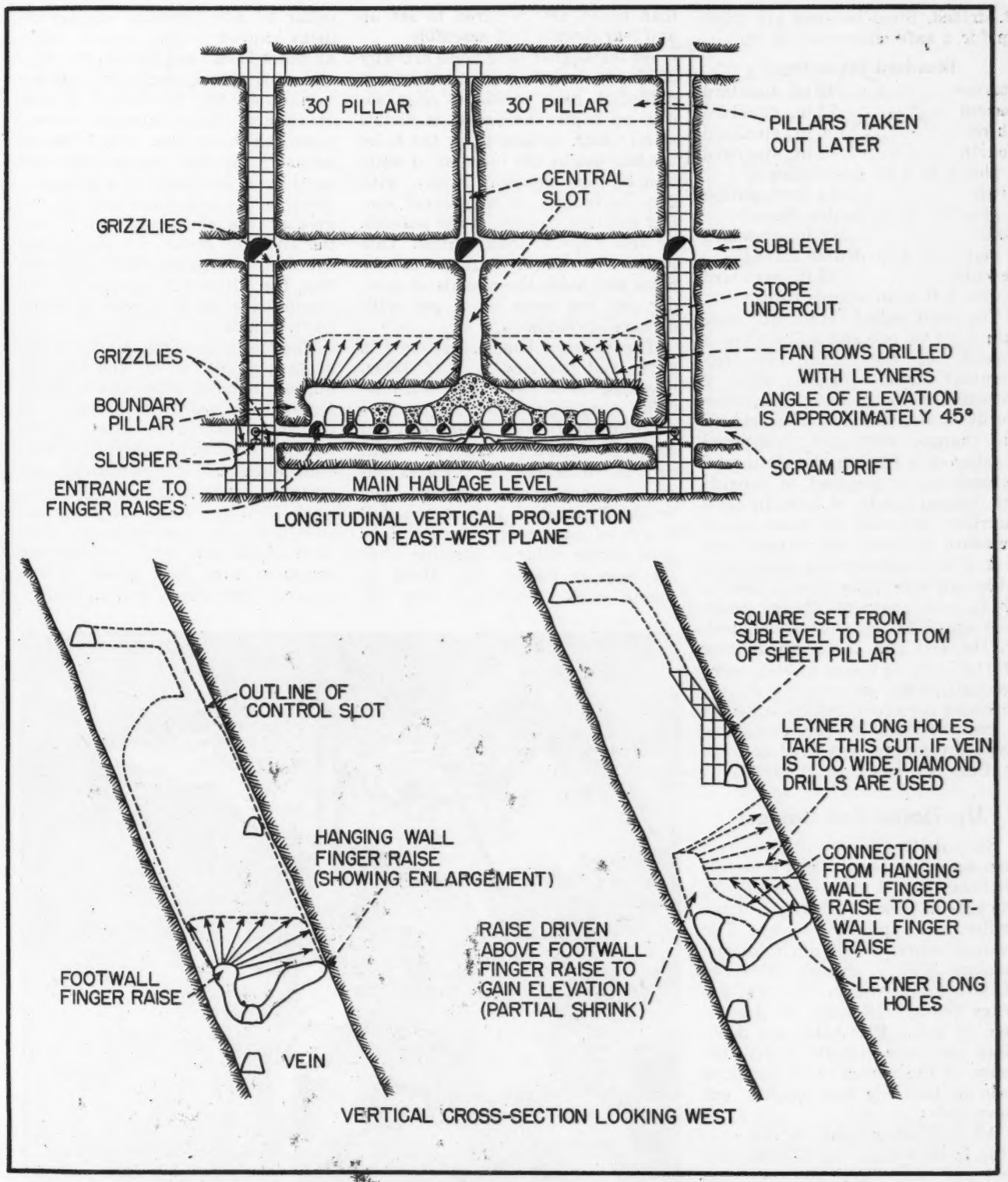
How Stopes Are Prepared

In general, a block of ground 200x200 ft. is prepared for mining by (1) driving connecting raises through from level to level, (2) installing a scram or grizzly system (depending on tonnage of ore in block), (3) preparation of a 30-ft. undercut, (4) raising an 8-ft. vertical slot through the center of the block from footwall to hanging wall, and (5) driving a sublevel through the center of the block which is to be stoped.

From this sublevel long-hole rings are drilled vertically down on about a 100-deg. fan, and upward at 45 deg. on an 80-deg. fan, blasting to the center slot, as shown in the accompanying sketches. Retreat toward the service raises as ring drilling and blasting progresses. This method of drilling is safer than bench drilling and reduces preparation work.

In long-hole drilling both diamond drills and Leyner or drifter drills are used. Each does a distinct drilling job, the diamond drill serving best on down and horizontal holes exceeding 30 ft. in length; the drifter unit is found more flexible and efficient on holes 30 ft. or less, especially on 45 deg. up holes. The combination of up and down holes is the only practical way to work the block, for if it were mined by down holes only, two sublevels would have to be driven, whereas even more would be needed if up holes were used exclusively.

Drifter long holes are employed to best advantage in the preparation of undercuts and driving center slots. As shown, fingers are driven up from the scram drift or grizzles in sufficient numbers to cover the area to be drawn. The footwall fingers in turn are connected along the strike. Hanging-wall fingers are extended to the height of the undercut sill and subsequently enlarged to about a 12-ft. diameter, with a "dog hole" on the east-and-west ribs to connect them along the strike of the vein. This is for inspection purposes as the undercut progresses. When the central slot and production fingers have been completed, a long-hole drifter unit is set up on either side of the center slot, preferably on the footwall side, and long holes are drilled up on an angle of 45 deg. and fanned out to the hanging wall. Each row of holes is blasted into the center slot in sequence until the boundary pillars are reached. The complete undercut removes ore from the footwall to the hanging wall to a height of 30 ft. (from


30' PILLAR
30' PILLAR
PILLARS TAKEN OUT LATER
CENTRAL SLOT
GRIZZLIES
SUBLEVEL
STOPE UNDERCUT
GRIZZLIES
FAN ROWS DRILLED WITH LEYNERS ANGLE OF ELEVATION IS APPROXIMATELY 45°
BOUNDARY PILLAR
SLUSHER
SCRAM DRIFT
ENTRANCE TO FINGER RAISES
MAIN HAULAGE LEVEL
LONGITUDINAL VERTICAL PROJECTION ON EAST-WEST PLANE
SQUARE SET FROM SUBLEVEL TO BOTTOM OF SHEET PILLAR
OUTLINE OF CONTROL SLOT
LEYNER LONG HOLES TAKE THIS CUT. IF VEIN IS TOO WIDE, DIAMOND DRILLS ARE USED
HANGING WALL FINGER RAISE (SHOWING ENLARGEMENT)
CONNECTION FROM HANGING WALL FINGER RAISE TO FOOT-WALL FINGER RAISE
RAISE DRIVEN ABOVE FOOTWALL FINGER RAISE TO GAIN ELEVATION (PARTIAL SHRINK)
FOOTWALL FINGER RAISE
LEYNER LONG HOLES
VEIN
VERTICAL CROSS-SECTION LOOKING WEST

Long-hole Leyner drilling is employed for the rounds indicated on the above sections.

sill to back), or about 30 percent of the tonnage contained in the block. The large undercut area offers the following advantages: (1) It provides ample storage for large blasts from the sublevel above, and (2) results in better fragmentation and lower secondary breakage costs because of the distance which broken ore falls.

All long-hole Leyner drilling is done with Ingersoll-Rand DA 35 automatic drifters equipped with sliding-cone shells and mounted on standard bar-and-arm. In some instances, double jack bars are used. Drill sections are made from 1¼-in. round-hollow steels and fitted with I-R Type 2, four-point, side-hole Jackbits. Sections are joined by means of I-R Type 2 couplings. Starters are 2¾ in. and permit drilling a fairly long hole with ⅛-in. changes in gage. Used bits are annealed, ground to the closest ⅛-in. change, and tempered. Experience with one run of 650 Type 2 bits showed 11,977 ft. drilled for an average of 18.4 ft. per bit, representing a cost of $0.0499 per

ft. drilled. Steel sections are made up for a safe change of 32 in.

Standard Set of Steel

Starter .....42 in., standard
Second .....74 in., standard
Third .....106 in., standard
Fourth .....42 in., standard plus 8 ft. 8 in. double thread
Fifth .....74 in., standard plus 8 ft. 8 in. double thread
Sixth .....106 in., standard plus 8 ft. 8 in. double thread
Seventh .....42 in., standard plus 8 ft. 8 in. double thread

The units called "standard" contain a lug on one end and a Type 2 thread on the other, whereas "double thread" means Type 2 threads on both ends. In other words, a standard set of steel, 32-in. change, with the additional number of 8 ft. 8 in. double-thread extensions, is required to provide the desired length of hole. In close quarters sets may be made up of standard starters and seconds and 8 ft. 2 in. double-thread extensions. Although holes have been drilled to 48 ft. and up to 56 ft. the 30-ft. hole length is the most economical. In the test run involving drilling of 11,977 ft. 48 pieces of steel were reconditioned, or one rod rethreaded for every 285 ft. drilled at a cost of $0.0012 per foot. One Type 2 coupling was used per 713 ft. Cost per foot was $0.0052.

Up Holes Are Easiest

Each drifter is attended by two men—a drill operator and a helper. Drilling speeds vary according to the type of ground, efficiency of the driller, and number of set-ups. The average contract drill shift for one machine is 80 ft., though 120 to 140 ft. is not uncommon. The best average footage is made on the 45-deg. up holes. Flat holes and down holes are more difficult to drill because of the necessity of handling rods in the hole and blowing out down holes.

All drilling is done on contract. This is on a basis of 12 cents per foot per man-shift, and 24 cents per foot total with two men per machine. Standard-drill contracts on short holes (9 ft. minus) average about 7c per foot. On two large undercuts in ground composed of medium and medium-hard garnetized limestone and porphyry stringers, the average footage drilled per hour was 14.62. This included the time required for setting up and tearing down air and water delays, and others. Each set-up is good for about 300 ft. of drilling, and six man hours are required to set up and tear down a drill assembly.

As the Leyner long holes are only 30 ft. in length, and as they are drilled in most instances on a 45-deg. up angle, the breast is visible at all times. Consequently the holes are laid out by the foreman or shift boss on duty. Blasting is done with 2-in. cartridges of 40 percent special gelatine powder, made possible by the Type 2 holes drilled. This permits a larger burden on the holes and holds the pounds of powder per ton more on a par with diamond-drill blasts.

The average burden per hole is 4 ft., and per row is 7 ft. When breaking to a clean face with no tight corners, all holes are shot simultaneously with Primacord and a single electric cap. In tight ground, or where the face is uneven owing to a previous poor break, Primacord is run the full length of each hole but cut off as close to the collar as possible after the hole is loaded. The third or fourth stick of powder from the collar of hole contains an electric delay cap of proper timing. After all holes have been loaded, the electric caps are connected in "series-in-parallel" and the round is shot. Maximum fragmentation occurs when all holes are shot simultaneously, for the reason that the more force expended in a given instant in the area to be blasted, the greater the shattering effect and the finer the break. Primacord has definitely simplified blasting practice, for without it an electric cap would have to be placed at every 10 ft. of hole.

The long-hole work described has made possible safer and cleaner mining, reduced delay and labor by eliminating nearly 80 percent of the work required in setting up and tearing down drill assemblies, barring down, and complementary operations experienced in short-hole work. Man-hours are saved by possible reduction of stope preparation work. Total cost per ton of Leyner long-hole work done in one of the undercut operations was $0.5761.

FROM SET-UPS such as this, a ring of holes averaging about 30 ft. in depth is drilled with a set of steel and extensions. Starter bits are 2¾ in., and successive bit sizes decrease by ⅛ in.

Flexible Flowsheet Treats Varying Lead-Zinc Ore

C. E. CRAVEN, Metallurgical Superintendent, Mammoth-St. Anthony, Ltd., Tiger, Ariz.

Probably the most complex and interesting problems in milling are met in separating minerals by differential flotation. In the lead-zinc separation described in detail here, flexibility in use of both equipment and reagents has been of unusual and noteworthy importance.

THE MINE AND MILL of Mammoth-St. Anthony, Ltd., is situated 48 miles northeast of Tucson, at Tiger, Pinal County, Ariz., which makes it readily accessible, and close to the source of supplies required by such an operation. It is on a good road 22 miles from Winkelman, Ariz., which is the railhead serving the mine.

The mine is unique in that 58 minerals have been identified in the ore, of which at least eight are of commercial value and have been mined for their content of gold, silver, molybdenum, vanadium, copper, lead, and zinc. The property was first operated as a gold mine, but through a steady evolution the minerals of cerrusite, wulfenite, and vanadinite became economically recoverable. Later in the operation sulphide zones were encountered where galena and sphalerite, together with copper, gold, and silver, were developed.

Because of a labor shortage, only the sulphide ores are being handled at present, and milling of sulphides will be dealt with in this article.

Mining

Sulphide ores are mined between the 700-ft. and 1,025-ft. levels of the Collins vein, and ore extends 1,600 ft. along the vein. Battery locomotives haul the ore 2,500 ft. to the Mohawk shaft for hoisting to the surface. Some ore is handled through interior winzes, particularly from the 1,025-ft. level to the 900-ft. level, which is the main haulage level for sulphide ore. Ore from the upper levels is dropped through stopes and ore passes to the 800-ft. level, where it is drawn off for tramming to the ore pocket at the Mohawk shaft.

Present labor supply enables the mine to produce approximately 6,000 tons per month, which is the current milling rate. The mill operates only six days a week and part of the time on reduced tonnage.

Values are in galena, sphalerite, and chalcopyrite, which occur in a gangue of rhyolite, quartz, and granite. Some undesirable oxide minerals are present but cannot be eliminated in mining. A typical analysis of the ore is as follows:

	Percent		Percent
Pb	7.61		
Zn	8.87	Fe	7.5
Non-sulphide Zn	1.27	SiO_2	47.5
Au, oz.	0.011	S	22.10
Ag, oz.	1.53	Ca	2.75
Cu	0.74	Mg	0.60

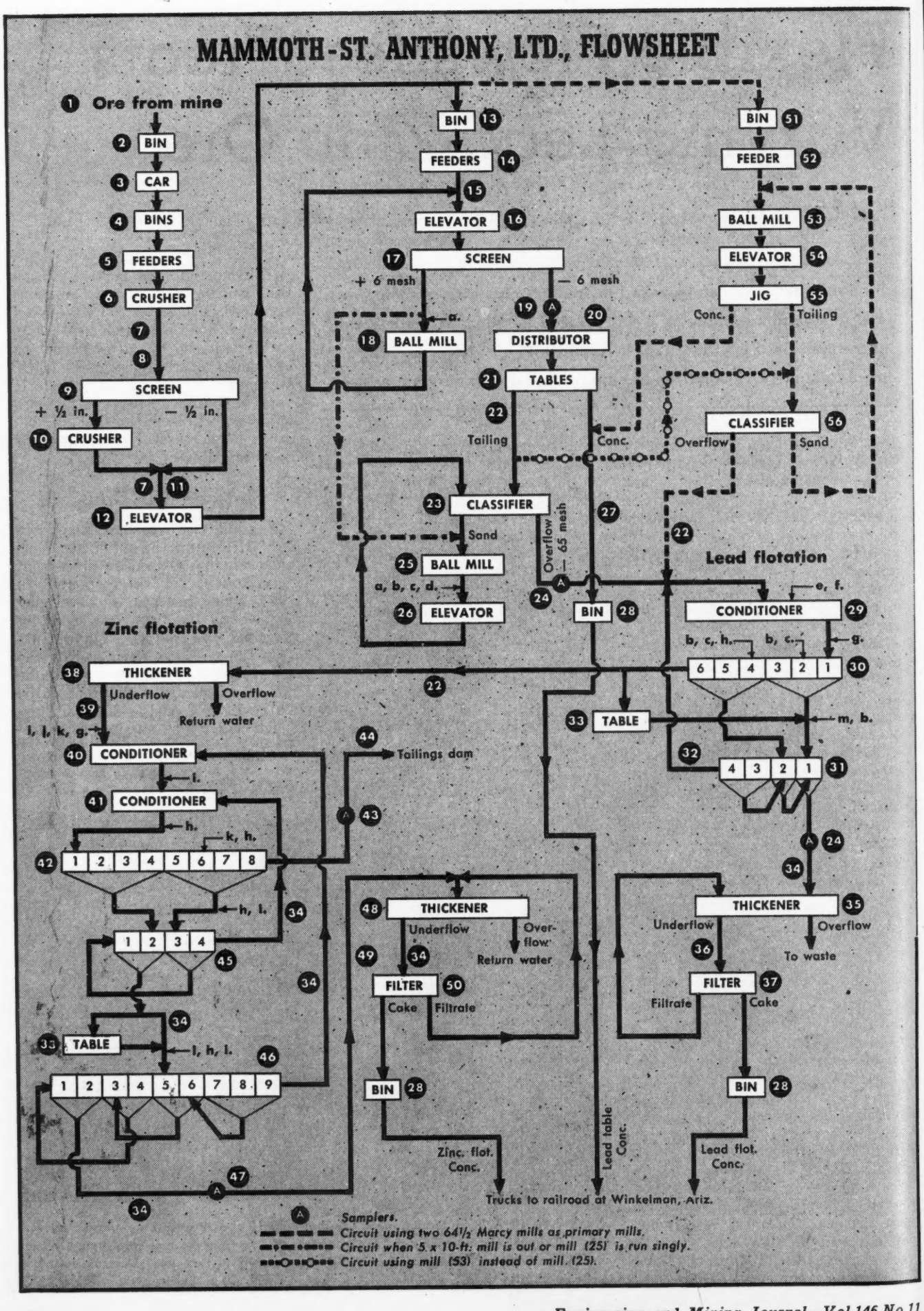
The non-sulphide portion of the zinc is made up of varying amounts of oxides, carbonates, sulphates, and silicates, none of which are recoverable except by attachment or mechanical entrainment in the froth. Zinc metallurgical results, therefore, vary with the amount of non-sulphide zinc present in the ore, because no successful treatment has been found.

Flowsheet Is Unusual

Sulphide ore was first treated in July 1942, and the mine has been in continuous operation since that time, except for three months in 1944 when operations were suspended due to a fire.[1] At first, a 150-ton mill was operated, but in July 1944 the mill was expanded by the use of idle equipment from the oxide mill to a capacity of 300 tons daily. This will explain the unusual flowsheet, which was adapted to equip-

[1]For ingenious shaft repair job following this fire, see E.&M.J., Dec. 1944, p. 92.

MOHAWK SHAFT of Mammoth-St. Anthony, Ltd., showing surface plant that replaced equipment destroyed by fire last year. Sulphide ore comes from below pit in hill in background, is hoisted, and then transferred to two steel bins at right by special shuttle car.


MAMMOTH-ST. ANTHONY, LTD., FLOWSHEET
1 Ore from mine
2 BIN
3 CAR
4 BINS
5 FEEDERS
6 CRUSHER
7
8
9 SCREEN
+ ½ in.
— ½ in.
10 CRUSHER
7 11
12 ELEVATOR
BIN 13
FEEDERS 14
15
ELEVATOR 16
17 SCREEN
+ 6 mesh
— 6 mesh
a.
18 BALL MILL
19 A
20 DISTRIBUTOR
21 TABLES
22
Tailing
Conc.
23 CLASSIFIER
Sand
Overflow — 65 mesh
25 BALL MILL
a, b, c, d.
26 ELEVATOR
24 A
27
BIN 28
Zinc flotation
Lead flotation
BIN 51
FEEDER 52
BALL MILL 53
ELEVATOR 54
JIG 55
Conc.
Tailing
CLASSIFIER 56
Overflow
Sand
e, f.
CONDITIONER 29
b, c, h.
b, c.
g.
6 5 4 3 2 1 30
38 THICKENER
Underflow
Overflow
Return water
39
l, l, k, g.
40 CONDITIONER
i.
41 CONDITIONER
h.
k, h.
42 1 2 3 4 5 6 7 8
h, l.
34
1 2 3 4
45
34
33 TABLE
l, h, l.
46
1 2 3 4 5 6 7 8 9
47 A
34
44
Tailings dam
43 A
33 TABLE
m, b.
32
4 3 2 1 31
A 24
34
48 THICKENER
Underflow
Over-flow
Return water
49 34
FILTER 50
Cake
Filtrate
BIN 28
Zinc. flot. Conc.
Lead table Conc.
THICKENER 35
Underflow
Overflow
To waste
36
FILTER 37
Filtrate
Cake
BIN 28
Lead flot. Conc.
Trucks to railroad at Winkelman, Ariz.
A Samplers.
Circuit using two 6½ Marcy mills as primary mills.
Circuit when 5 x 10-ft. mill is out or mill (25) is run singly.
Circuit using mill (53) instead of mill (25).

LEGEND

1. Mine skip, 1½-ton
2. Bin, 10-ton
3. Shuttle car, special design
4. Circular steel ore bins, two 175-ton
5. Allis-Chalmers pan feeders, 24-in.
6. McCully gyratory, No. 4, 3-in. discharge
7. Belt conveyor, 16-in.
8. Magnetic head pulley, Stearns
9. Robins Gyrex screen, 24-54, ½-in. punched plate
10. Symons short head cone, coarse bowl, 3-ft.
11. Merrick Weightometer
12. Bucket elevator, 12-in.
13. Wooden ore bin, 650-ton
14. Belt ore feeders, four 12-in.
15. Belt conveyors, two 16-in.
16. Bucket elevator, 16-in.
17. Leahy vibrating screens, two, 48x54-in., 6 mesh.
18. Marcy ball mill, grate discharge, 5x10-ft., two-tire.
19. Southwestern sampler, 24-in., 30-min. interval, 95-lb. daily sample
20. St. Joe classifier, two spigots used as distributor
21. Two Deister Plat-O tables
22. Wilfley sand pump, 3-in.
23. Dorr duplex classifier, 6x22-ft.
24. Geary-Jennings sampler, 24-in.
25. Marcy ball mill, 64½, 25 rpm.
26. Bucket elevator, 18-in.
27. Belt conveyor, 12-in.
28. Concentrate storage bin
29. Denver conditioner, 5x5-ft.
30. Denver flotation machine, 6-cell, No. 21.
31. Denver flotation machine, 4-cell, No. 18.
32. Dorrco diaphragm pump, 3-in.
33. Wilfley laboratory table, takes continuous cut
34. Wilfley sand pump, 2-in.
35. Dorr thickener, two 15x10-ft.
36. Wemco diaphragm pumps, two 3-in.
37. Eimco drum-type filter, 6x6-ft.
38. Dorr thickener, 60x10-ft.
39. Dorrco quadruplex diaphragm pump, 4-in.
40. Denver conditioner, 6x6-ft.
41. Denver conditioner, 6x6-ft.
42. Denver flotation machine, 8-cell, No. 21.
43. Southwestern sampler, 24-in.
44. Wilfley sand pump, 4-in. type CA.
45. Denver flotation machine, 4-cell, No. 18.
46. Denver flotation machine, 9-cell, special No. 18.
47. Water tipple sampler
48. Dorr thickener, 40x10-ft.
49. Dorrco duplex diaphragm pump, 4-in.
50. American filter, 4-leaf, 6-ft.
51. Ore bin, 125-ton
52. Belt ore feeder, 12-in.
53. Marcy ball mill, 64½
54. Bucket elevator, 16-in.
55. Denver mineral jig, 18x24-in., 2-cell.
56. Dorr duplex classifier, 5x20-ft.

REAGENTS

To 5 x 10-ft. ball mill (18)
- a. Thiocarbanalide

To 64½ Marcy ball mill (25)
- a. Thiocarbanalide
- b. Sodium cyanide
- c. Zinc sulphate
- d. Soda ash

To lead conditioner (29)
- e. Sodium sulphite
- f. Reagent B-23

To lead roughers (30)
- g. Z3 Xanthate
- b. Sodium cyanide
- c. Zinc sulphate
- h. Z6 xanthate

To lead cleaners
- m. Zinc hydro-sulphite
- b. Sodium cyanide

To first zinc conditioner (40)
- i. Lime
- j. Reagent No. 241
- k. Copper sulphate
- g. Z3 xanthate

To second zinc conditioner (41)
- i. Lime

To zinc roughers (42)
- h. Z6 xanthate
- k. Copper sulphate

To first zinc cleaner (45)
- h. Z6 xanthate
- i. Lime

To second zinc cleaner (46)
- l. Pine oil
- h. Z6 xanthate
- i. Lime

Table I. Total Current Reagent Consumption

Reagent	Amount used (lb./ton of ore)
Xanthate, Z-3	0.15
Xanthate, Z-6	0.32
Reagent B-23	0.067
Reagent 241	0.05
Sodium cyanide	0.71
Zinc Sulphate	0.87
Zinc hydro-sulphite	0.10
Copper sulphate	2.91 to 4.6
Thiocarbanalide	0.15
Sodium sulphite	0.12
Lime	4.00 to 6.6
Soda ash	0.22

ment already in place in the two units. Great flexibility was the virtue resulting from this necessity.

Crushing

Ore from the mine is hoisted in skips to a small bin on the headframe of the Mohawk shaft and is transferred to the two 175-ton steel ore bins by a shuttle car of unusual design. Drawn from these bins by two pan feeders, the ore, which has been put through a 7-in. grizzly underground, is fed to a No. 4. McCully gyratory. Treatment of the ore in the crushing and grinding plants thereafter follows the flowsheet.

In brief, a 5-ft. Symons cone reduces the ore to minus ½ in., and a first stage of grinding reduced it to minus-6 mesh. This material is then distributed by two pockets of a St. Joe classifier (no hydraulic water used) to two Plat-O tables, which recover a lead concentrate.

Purpose of these two tables is to scalp off a part of the ore's galena content to prevent surges of high-grade feed to the lead flotation roughers, where there is not enough flotation capacity if heads run above 8 percent lead. When mill heads run below 7 percent lead, tabling is discontinued, because otherwise the grade of the lead concentrate suffers. It appears that more zinc floats in the lead roughers if there is a deficiency of lead in the froth there.

Two Plat-O tables handle the entire tonnage, and they recover about 41 percent of the lead in the ore in a concentrate containing 74 percent lead and 2 percent zinc. This concentrate is dewatered and then drained on a concrete slab. Once daily it is shoveled onto a 12-in. belt conveyor that elevates it to a loading bin. This concentrate is shipped to the A.S.&R. El Paso smelter separately.

Grinding

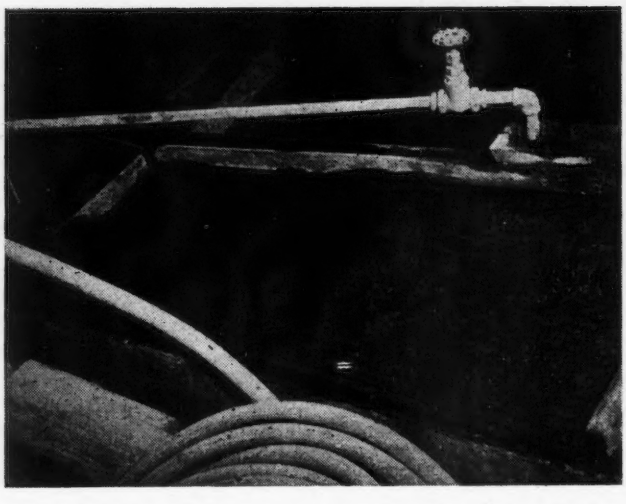
Table tails are reground in a separate grinding circuit. Two-stage grinding of this sort is used because the equipment is available and the results are good. Single-stage grinding has been used successfully, the circuit including the 64½ Marcy mill and the tables or a Denver jig. With three mills available, it is possible to use one or two 64½ Marcy mills or one 64½ and the 5x10-ft. mill, depending on tonnage available or need of repairing a mill. Any two of the mills will handle over 300 tons daily. Density of the regrind ball-mill discharge is checked hourly and is held at 70 percent solids.

Manganese steel liners of the Howes double-step design are used, and a set of them handles about 60,000 tons. Consumption of steel balls up to August of this year has averaged 3.22 lb. per ton.

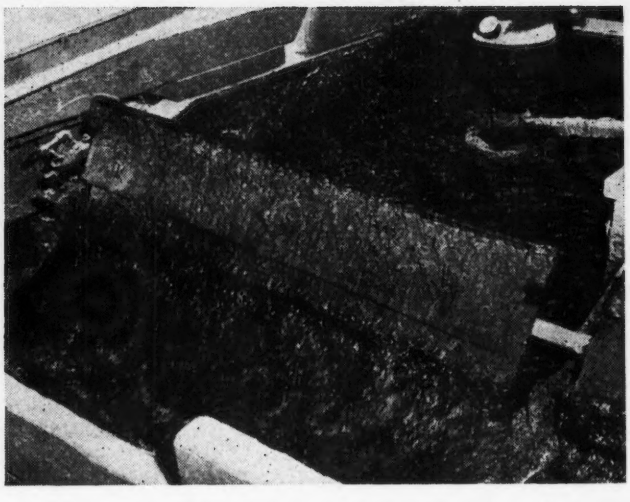
Classifier overflow is maintained at a specific gravity of 1.240, which produces an average grind as follows:

Size	Percent Weight
+ 65	2.0
— 65+100	5.0
—100+200	18.0
—200	75.0

The overflow is sampled by hand



PILOT TABLES are laboratory size in the Mammoth mill. This one is taking a cut of the lead flotation tailing; it shows operators constantly how their cells are doing.



ZINC FROTH on the No. 1 zinc rougher cell is extremely heavy and tends to be dry, due to over-flocculation. This condition is controlled as far as possible by adjusting lime additions.

at hourly intervals to supply a daily shift screen analysis.

Thiocarbanilide is added to the grinding circuits at the rate of 0.12 lb. per ton, and is split between the two mills. Cyanide and zinc sulphate are added to the regrind mill as zinc depressors in the following amounts: NaCN, 0.2 lb. per ton; $ZnSO_4$, 0.45 lb. per ton. In the 5x5-ft. conditioner to which classifier overflow is pumped, 0.08 lb. per ton of B-23 frother is added. B-23 is used because it has less tendency to promote zinc flotation than cresylic acid or pine oil. Choice and control of frother are of considerable importance.

Regulating pH

Alkalinity of the circuit is pH 7.5. Soda ash to the extent of 1.5 lb. per ton was considered essential as an alkalinity regulator (pH 7.7) until recent tests showed under certain conditions, that an improved grade of lead, and reduced zinc content could be obtained in the lead flotation concentrate without use of soda ash.

Sodium sulphite (0.12 lb./ton) used with soda ash was better than soda ash alone. Likewise, sodium sulphite alone was better than the combination, although the result is a slight tendency for some slow-floating lead to escape from the roughers. The lead assay in zinc concentrate has remained about the same, with only a small increase of lead content in the tailing. The increased grade of lead concentrate and the improved zinc recovery more than compensate for the small drop in lead recovery. However, at times it is necessary to add soda ash and sodium sulphite to maintain optimum lead flotation conditions. The finished lead concentrate had the following grade:

	Percent		Percent
Pb	61.0	Cu	4.1
Zn	7.0	Au, oz.	0.04
Insol.	1.25	Ag, oz.	8.5

Reagents Stage Added

Z-3 xanthate is added to lead rougher cell No. 1 as required, but seldom exceeds 0.01 lb. per ton. Z-6 xanthate is added to No. 5 lead rougher to the extent of 0.02 lb. per ton, the amount depending on the lead appearing on a pilot table handling a small cut of the lead tailing. The use of the pilot table gives a continuous visual panning of the lead rougher efficiency, and enables the operators to correct immediately any variation in operation of the cells.

Xanthate additions are held to a minimum at all times, and an entire week has gone by with no xanthate being required to effect good recovery of the galena. Sodium cyanide is added to No. 3 and 5 lead roughers at a rate of 0.06 lb. per ton each, and zinc sulphate is added simultaneously at a rate of 0.12 lb. per ton to each of the same cells.

Sodium cyanide is added to No. 1 lead cleaner cell at 0.1 lb. per ton, and zinc hydrosulphite, 0.09 lb. per ton. Both act as zinc depressors.

It will now be apparent that stage addition of reagents is practiced to an unusual degree. This practice has been found more beneficial than bulk addition, because the large amounts required by the ore would, if added in bulk, cause serious difficulty in controlling froth on the cells. On a clean ore having few injurious elements, bulk additions would be possible, but here the variable character of the ore renders it impracticable. Reagents tend to wear out when large quantities of oxides and soluble salts are present in the pulp. This is particularly true in the zinc circuit, where tarnished or partly oxidized particles are known to exist, and need additional collector to maintain their amenability to flotation.

Filtered lead concentrate is hauled by trucks to Winkelman for shipment to the A.S.&R. smelter at El Paso, Tex.

Zinc Flotation

Lead tailings are pumped to a thickener, the underflow of which is adjusted to give pulp density entering the zinc rougher of 1.160 to 1.180, or 20 to 25 percent solids. With the various middling returns from zinc re-cleaners, a density of around 1.320 is required as an average.

Thickener underflow flows by a launder to two conditioners in series, where reagents in the following amounts are added:

Reagent	Wt., Lb/Ton
No. 1 Conditioner	
Lime	0.40
Z-3 xanthate	0.18
Copper sulphate	0.40
Reagent No. 241	0.09
No. 2 Conditioner	
Lime	2.00

Reagent additions to the zinc roughers (8 No. 21 Denvers) are as follows: No. 1 cell receives 0.10 lb. per ton of xanthate, Z-6; No. 5 cell, 0.2 lb. per ton $CuSO_4$; No. 7 cell, 0.02 lb. per ton xanthate, Z-6.

Froth on No. 1 zinc rough cell is very heavily laden and rather dry,

Table II. Typical Metallurgical Data

Product	Lead	Assay Total Zinc	Assay Sulphide Zinc	Head	Recovery (Percent) Total Zinc	Recovery (Percent) Sulphide Zinc
Total heads	8.20	9.20	7.90	100.00	100.00	100.00
Table concentrate	74.10	2.09	2.00	40.98	0.98	1.14
Heads to flotation	5.07	9.54	8.18	....	....	....
Lead flotation concentrate	61.00	7.00	6.84	46.59	4.78	5.44
Total lead concentrate	66.48	4.91	4.80	87.57	5.76	6.58
Zinc concentrate	4.80	54.50	54.24	7.80	78.91	86.96
Total concentrates				95.37	84.67	93.54
Mill tailing	0.50	1.86	0.66	4.63	15.33	6.46

	Assay (Percent) Lead Table Concentrate	Lead Flotation Concentrate	Zinc Flotation Concentrate
Lead	74.10	61.00	4.80
Zinc	2.09	7.00	54.50
Copper	5.00	4.50	1.44
Gold, oz.	0.035	0.045	0.015
Silver, oz.	6.80	8.50	2.63
Insol.	0.90	0.90	3.65
Iron	3.50	0.50	3.80

due to over-flocculation. This condition gradually decreases down the machine, the last four cells producing large kidney-shaped bubbles that are tough and stable. A pH of 10.7 is maintained throughout the zinc circuit, with an excess of lime in most cases to give proper froth characteristics.

Multiple Zinc Cleaning

As shown in the flowsheet, zinc rougher concentrate is cleaned repeatedly to secure a high-grade concentrate. Operation of this circuit requires care both in point of addition and in quantity of reagents, because froth conditions are markedly affected by reagent concentration.

In the first zinc cleaner, a four-cell machine, about 0.50 lb. per ton of lime and 0.08 lb. per ton of Z-6 are added to the second cell. The xanthate used here serves both to keep the froth dry and to maintain proper collector concentration. This four-cell machine is too small for adequate recleaning, but it is used as a part of the cleaner circuit because of its convenient location in the mill.

In the second zinc cleaner, a nine-cell machine, reagents are added as follows: lime, 0.50 lb. per ton; pine oil, 0.007 lb. per ton; xanthate, Z-6, 0.10 lb. per ton; all to No. 3 cell. The lime is needed to hold the proper alkalinity (pH 10.7) and froth characteristics. Pine oil serves as the additional frother needed, and the Z-6 maintains the floatability of the sphalerite. In multiple recleaning of this sort, the sphalerite must be kept floating or the cells will become sluggish and too great a circulating load will build up.

Froth is advanced from each pair of cells (and the last three) for recleaning, and finished zinc concentrate is taken off the first two cells. Thickened and filtered zinc concentrate is hauled by truck to Winkelman for shipment to the A.S.&R. smelter at Amarillo, Tex.

Mill tailing is elevated 90 ft. to a tailings dam by a 4-in. Wilfley sand pump through about 1,000 ft. of 5-in. O.D. pipeline. No water is recovered from the tailing, because sufficient fresh water is available from the mine.

Current mine water supply is 1,200 g.p.m., which is more than enough for domestic and milling purposes. Return water from thickener overflows is used on elevator, screens, tables, and mills; fresh water supplies all other requirements.

Reagents

Total reagent consumption for a current period is given in an accompanying table. Lime, soda ash, and thiocarbanilid are fed by Denver cone-type dry reagent feeders. B-23 is fed undiluted. Copper sulphate is fed as a saturated solution. All other reagents are mixed in a 10 percent solution and are fed by Clarkson reagent feeders.

Reagents are mixed in tanks of sufficient capacity that 300 lb. of zinc sulphate, one drum of xanthate, two drums of cyanide, one drum of zinc hydrosulphite, or five gallons of Reagent 241 can be mixed at one time. Two tanks are provided for each reagent, so that one batch can be mixed when the other gets low.

This arrangement eliminates weighing of reagents, for when the tanks are filled with water to an indicated level, the mixture will be at the proper concentration. Air and an electric agitator are provided for mixing. Pipelines carrying the several reagents are painted in distinctive colors to prevent errors. Most reagent feeders operate on float valves direct from the large tanks in order to eliminate as much reagent handling as is at all possible.

Reagents being fed are measured hourly, where required, and the data are recorded on a mill sheet, which provides a valuable record of performance. Duplicate conditions can be reproduced from this record if the occasion demands.

The careful reagent control practiced gives steady results, and any variation in character of ore or change of reagent can be readily noted. Daily metallurgical results check monthly shipments within narrow limits.

Operation Flexible

Many improvements have been made during the past year by careful attention to detail and by taking advantage of the flexibility of operation made possible by using idle equipment run originally in treating oxide ores. Substantial increases have been made in both lead and zinc recoveries.

The use of tables as noted previously has enabled us to keep the lead concentrates high in lead and low in zinc without increased tailing losses. By using otherwise idle cells from the oxide mill, multiple recleaning of zinc concentrate was made possible and the zinc content has been raised from less than 50 percent to the present figure of 54.5 percent. The lead content has been slightly reduced by the multiple recleaning.

Microscopic examinations made on the mill tailings show very little sulphide mineral present, and the few middlings found are beyond economic liberation. The non-sulphide zinc has not been identified as to quantities present of each mineral, but the absence of any large amount of sulphides in the tailings assures us that a satisfactory recovery of the lead and zinc as galena and sphalerite is being made.

How Hudson Bay Runs Its Mine Warehouse

P. G. BISHOP, Hudson Bay Mining & Smelting Co., Flin Flon, Man.

II. Great care marks the procedure followed in ordering equipment and supplies from the purchasing agent or for fabrication in the company's shops. Likewise, when the material is received, details are closely checked to guard against mistake. The precautions observed pay for themselves in the end. Part I was published in the October issue.

ORDERING OF MATERIAL by the stores department from the purchasing agent is a matter demanding extreme care and exactness. The purchase requisition form used by the Hudson Bay company is 11⅜ in. wide and 8½ in. deep top to bottom. It is printed in four copies of different colors, the original and duplicate copies being of heavy paper and the other two of onion-skin weight. This requisition is illustrated (I).

The letters (a) to (n) shown on the form as reproduced are added here merely for explanatory purposes. They are not actually printed on the form. An additional manila sheet is also typed by the Stores office. Particular attention is drawn to the typed instructions on the form. The illustration shows an item of bolts. The process of making up the requisition is as follows:

A number is taken from a list and each succeeding number is crossed off as used. In Column (a) is shown the class of material and whether the item is for stock or direct charge. In case the item is for immediate use on arrival, and not to be placed in warehouse stock, the charge account number would be shown instead of the word "stock." The classification of material—in this case "H" for shelf hardware — is the same as given before.

Column (b) gives the quantity desired; (c) the description. Columns (d) and (e) are for purchasing department use, although the warehouse will write in the purchase order number on the warehouse file copy, in column (e), when a copy of the purchase order arrives. This order number is written exactly opposite the items, or several items are bracketed if on one purchase order.

In column (f) the warehouse shows the purchase order number on which this particular item was last previously bought. This is valuable information for the purchasing department, especially on material of a technical nature, as it shows which and what type of firm supplied the former purchase and the cost. This is a time-saver in buying and helps the purchasing agent to make a good check.

Column (g) shows the total cost of the lot, as previously purchased; (h) gives the quantity on hand at time of requisition and (i) the last 90-days' consumption. Column (j) indicates the quantity of the same item already ordered by purchasing department but not yet received by the warehouse. Columns (g) and (j) inclusive give the management

1. Purchase Requisition Form

MINING COMPANY

REQUISITION No. 1022

For material required at..... Date.....

Class	Quantity	Description	Price	Ordered From	Order	Total Cost	On Hand	Used Last 90 Days	Due on Orders
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
STOCK H	1000	½x3 bolts		40050	30206		300	800	0
		(W. Adams' I. O. Reqn.1002)							

Reqn. by (k)_____ Approved by (l)_____ Superintendent (M)_____ Storekeeper (N)_____ Purchasing Agent.

White Sheet (original) to be sent to Purchasing Agent. Pink Sheet (duplicate) to be retained by Storekeeper. Blue Sheet (triplicate) to be retained by person issuing same.

in concise form where the plant stands on every item. It is well to estimate a cost for column (g) if there is no former purchase.

If a department sends an inter-office requisition to the warehouse, it is noted on the purchase requisition as shown. The use of this inter-office requisition will be explained later. When the warehouse makes up its own requisition this inter-office requisition reference is omitted.

Signing of Requisitions

The warehouse usually follows the stock book and makes up a rough pencil requisition in one copy, showing full information. It is then typed in four regular copies and one extra manila copy. The manila copy is held at the warehouse in a separate folder and is used to index the requisition to the proper stock-book pages, as will be illustrated later. If the regular copies are not signed and returned promptly from the signing officials, the manila copy is held and the others are traced for return. The other four copies are all signed by the storekeeper in space (m) and then sent out for further signature.

The inter-office requisition is intended for special items. When any department has sent one of these requisitions in, all four copies of the resulting purchase requisition go to that department's head, who signs all of them in space (k) and retains the thin blue copy. The remaining three copies go to the general superintendent, who signs in space (l) and retains a thin white copy. If

2. Inter-Office Requisition

MINING COMPANY

INTER-OFFICE REQUISITION No. 27997

Date August 25, 1945

Note: If material is required for use immediately on receipt of same, give charge account number; if not for immediate use state "for stock." When ordering spare parts for equipment, give full description of same, including model, serial number, etc., and also give location.

Stock or Charge	Quantity and Item	Equipment or Purpose
A 710-030	FOR ASSAY LAB. 12 - 500 cc #402 Beakers	

Requested by "R. Smith" | Recommended by "L. Baker"

The above has been covered by Purchase Requisition No. 31200 Dated Aug. 26/45

3. Original Purchase Order Which Goes to the Supplier

Order 60020

MINING COMPANY

PURCHASING DEPARTMENT

Date September 19th, 1945

TO: John Smith,
WINNIPEG, Man.

Please address packages plainly

MINING COMPANY
Flin Flon, Manitoba. | Order 60020

Route via: Cheapest way

NOTICE TO SHIPPERS

Please note following instructions:

1. Mail *promptly* to the Company four copies of invoice, original and memo bill of lading, and 1 copy of packing list.
2. Inclose one copy of packing list in each shipment.
3. *Please show our order number on all packages and documents.*
4. Invoice each shipment separately as soon as shipped. Do not include more than one order in same package.
5. We will not pay cartage to railroad.

ITEM	QUANTITY	
1	10	bars ½" Round Mild Steel
2	20	bars ¾" "
3	20	bars 1" "

Price: $3.00 base per 100 lb.
F.O.B. Winnipeg

For Company Use Only

Requisition No. 3021

MINING CO.

PER —

Purchasing Agent

4. Warehouse File Copy of Purchase Order

WAREHOUSE FILE COPY OF PURCHASE ORDER

Col.	Inv. No.	Inv. Date	Amount	Notes
A				
B				
C				
D				
E				
F				

No. 60020

Date September 19th, 1945

TO: John Smith
WINNIPEG, Man.

Order No. 60020
Route via:
Cheapest way

F	E	D	C	B	A	Item	Quantity	
						1	10	bars ½" Round Mild Steel
						2	20	bars ¾" "
						3	20	bars 1" "
								Price: $3.00 base per 100 lb.
"I"								"STOCK" F.O.B. Winnipeg.

REQUISITION NO. 3021

Per

Purchasing Agent

5. Job or Shop Order

MINING COMPANY

JOB ORDER

TO: MACHINE SHOP SHOP 2-D-1247

Job No. 1781
Date ordered Feb. 18/45
Date required Mar. 2/45

Please do the following work:
EDCBA
pppp
(X)

FOR 3½" S.S. COLUMN
Please make:
50 - No. 6-12T. Hook Bolts
Refer to Order 2-D-1193

SHOP FOREMAN:
When this job is completed, date and sign this copy and return to Office.
Date completed.....Signed.....
Shop Foreman

Signed .....

CHARGE TO:

(X) NOTES
Columns A, B, etc., indicate partial debits issued monthly by Accounting Office. Receiving slips are made for all partial charges and attached to shop order in warehouse file. Record of quantity received at warehouse is noted on book copy of the job order, which copy is destroyed when the order is completely filled.

6. Freight Bill, Incoming

FREIGHT BILL

Winnipeg, Man.
Sept. 17, 1945

Customs No. Frt. Bill Sheet No.
.....RAILWAYS

Route W/B from:	W/B Date	W/B No.	NAME OF SHIPPER	CAR NO.
	Sept. 17th	72	John Jones Co.	CN-510600

No.	Description	Wgt.	Rate	Freight	Advances	Total
2	kegs IRON RIVETS	420	1.00	4.20		4.20

56752 (our order number)

the purchase requisition is made up by the warehouse and there is no special request from a department, the thin blue copy need not be typed and other copies go to the general superintendent directly, who returns the original white copy and duplicate pink to the warehouse. The original is forwarded to the purchasing department and the pink copy is placed on a filing board, the last number always on top.

Though the copies are all dated when typed, the original and duplicate pink are stamped with a dating stamp, showing the date mailed, because often the signing by department heads has been delayed and the exact date of mailing is good information. The extra manila copy is also now stamped with the mailing date and passed to the receiving clerk or warehouse foreman for his file and information.

In making purchase requisitions, it is better to change numbers with each sheet as filled, but if for some reason the same number is used for several sheets, they should be numbered Page 1, Page 2, etc. Items of the same kind should follow each other in size or number order. This is automatically taken care of when ordering from the stock book. When changing from one kind of material to another, it is well to type a few stars to break the place of change; in other words, be as clear as possible.

The Inter-Office Requisition

The inter-office requisition is shown (2). It really amounts to a memorandum from which a purchase requisition is made. These inter-office requisition forms are of letter size, in triplicate, there being 50 sets to a book and each set being numbered serially by the printer. When transferred to a regular purchase requisition, the number and date of the latter are placed at the bottom of the inter-office requisition.

The party who originates the inter-office requisition retains the triplicate in his book and sends the original and duplicate to the warehouse. The original is later returned to that department showing warehouse purchase requisition references. The duplicate copies are filed numerically at the warehouse under each department.

Responsibility for the special items ordered by a department is placed on that department by the inter-office requisition. Therefore, the form should be demanded by the warehouse and, if any doubt exists, it may be sent to the general superintendent for approval before ordering. Pencil memorandums and verbal requests for special orders are to be avoided.

The original purchase order used by the purchasing agent is next illustrated (3). On the reproduction printed here, note the instructions

at the left. No. 2 and No. 3 are especially important to the warehouse. It pays to complain about every shipment which does not conform to these rules until suppliers are "educated." Nothing wastes more time or is more disagreeable in a warehouse than hunting for purchasing orders because these rules have not been followed.

Also note that each item of the order is numbered consecutively. This is a great time-saver in writing or telegraphing about the order, as it saves describing complex items. Bills of material for construction purposes should show item numbers and items on the purchase order made to conform where possible, thus tying together the whole transaction.

The items on the purchase order used for illustration, were taken from a warehouse purchase requisition. It is unwise for a purchasing agent to order anything unless he has an authentic purchase requisition. To do so often results in errors, confusion, and various troubles and is very poor practice.

Purchase orders are made in several copies of different colors. This plant requires at least three copies —one for the warehouse, one for the department interested particularly, and one for the general office or engineering department. These orders are numbered serially as made, and the warehouse should keep a list of numbers from which each order number is crossed off when received. This enables the warehouse to inquire about numbers which do not come to hand. Conversely, the purchasing department should have a running list of the purchase requisition numbers and mark them off. A missing number in either place may cover some important item which is sidetracked in some way.

On receipt of the three copies of the purchase order, the warehouse marks the corresponding copy of the purchase requisition with the order numbers until every item on the requisition is covered, and then files the requisition in the dead file.

The warehouse sends one copy of the purchase order to the department interested—on general goods the copy is usually sent to the master mechanic. About twice weekly a set of copies is sent throughout the plant to all departments, with a memo attached reading as follows:

"If your name appears in the left-

7. Material Receiving Report and Delivery Slip

MINING COMPANY

MATERIAL RECEIVING REPORT and DELIVERY SLIP

Date	Sept. 10/45	Furnished by	F SHER CO.	Order	57520
Freight Pro		CAR No.	CN 712300	Placed	Assay Lab.
Express Slip		Seal No.	14212-3		
Mail	Local	Gross Weight	50 lbs		

Quantity	Description	Net Weight
12	500 cc #402 Beakers	486

Class	Shipment	Rec-Cost Record	Plant Stock	Whse. Stock	D/C to	Ledger	File
A	A	120			710-030	L.	OK

Deliver to	Assay Lab.	Delivered by:	Above received in good order by:		Warehouse Checker
Via	Truck			Date 9/11/45	
Date 9/11/45	Time 4 pm	R. Smith	A. Brown	Time 4:30 pm	R.D.

8. Receiving Slip for Material Going Into Regular Warehouse Stock

MATERIAL RECEIVING REPORT

Date	Sept. 20/45	Furnished by	John Jones Co.	Order	56752
Freight Pro.	1240	Car No.	CN 510600	Gross Weight	420
Express Pro.		Placed:	Section 1	Seal No.	12461
Mail				Seal No.	12462

Quantity	Description	Net Weight
400 lbs.	½ x 3 Rd. Hd. Iron Rivets (Or just rivets, as per attached invoice)	400 lbs.

Class	Shipment	Rec-Cost Record	Plt. Stock	Whse. Stock	D/C to	Ledger	File
H				X			

Received at..... R.D. Receiving Clerk

9. Receiving and Cost Record

MINING COMPANY

WAREHOUSE RECEIVING and COST RECORD

Month February, 1945

Date	Order No.	Ship No.	Pro Number	Class	Shipper and Article	Transportation Freight	Transportation Express	Invoice Amount	Duty	Local Chgs.	Total
1/30	61905	E	16585	V	North Amer. Cyanamid Cyanide	ppd		7,108.92			7,108.92
1/30	62112	A	137	M	Harnischfeger Corp. Wheels	5.59		83.60	37.80		126.99
1/31	61529	B	147	M	Harnischfeger Corp. Wheels	4.19		40.70	18.45		63.34

10. Receiving Stamp for Invoices

Prices O.K. X	Ext. O.K. Y
F.O.B.	Winnipeg
Date Goods Received	10/27/45
Quantity Checked	Z
Pro No.	2119
Amount of Freight	5.60
Customs Charges	Nil
Charge Account No.	8721

11. Purchasing Department Invoice Advice

MINING COMPANY No. 421

PURCHASING DEPARTMENT INVOICE ADVICE

Winnipeg, Man., October 4th, 1945

Warehouse Department,
We have charged your account for the
Month of October with the following invoices.

Signed:.....

NO.	DATE	NAME	AMOUNT
		Total previous charged this month:	$10,000.00
9220	9-28	John Jones & Son	10.00
9221	9-25	Wonder Coal Company	500.00
9222	9-28	Ajax Metal	200.00
		etc., etc.	
		Total charges this month to date:	$10,710.00

hand bottom corner of attached orders, you have received a copy. Otherwise, please initial the orders of which you require a copy."

When all copies are initialled, the lot is returned to the warehouse, which makes up any extra copies desired and sends the file to the general office. This plan allows all departments to see what is coming, helps coordinate work, and prevents something being overlooked.

The warehouse file copy and all other copies differ somewhat from the original purchase order as sent to suppliers, and the one file copy illustrated suffices for all. The warehouse copy is shown (4).

This is compared with the purchase requisition, and the order number is placed opposite each corresponding item on the requisition. The number of the order is then written in heavy blue pencil above the typed number at the top, as this makes the number much easier to see. The class letter of the material is written on the order in blue pencil and the word "Stock" if going into stock. If the material is for immediate use and direct charge, the charge account is written in place of the word "Stock" and the department to which the material goes is indicated.

A Useful Index

The order number is now crossed off the master list and each order is indexed on a card headed with the supplier's name. A small, plain card is used for each firm, and order numbers are typed for each firm in rotation, as received, until the card is filled on both sides, when a new card is placed in front of the older ones. These cards are alphabetically arranged in a filing case, and this index is well worth the trouble. After indexing, the orders are filed in a live file to await receipt of goods. Each order is kept in numerical sequence, the latest one in front.

Invoice references shown at the top of the form are for purchasing department use only. The letters A, B, C, etc., in the body of the order are used for various shipments. The first shipment received is marked "A" on the receiving form (explained later,) the next "B", and so on. If a large number of shipments are to come, as on a standing order, it is better to attach a ruled sheet on which shipments can be recorded.

Check Items Received

When receiving papers come into the warehouse office marked "Shipment A," a red pencil check is made against items received on the warehouse file copy of the purchase order. The one shown in (4) is for Order No. 60020. If only part of an item is received, the number of pieces in the shipment is written under the check mark—note line 1 of the illustration. If an invoice comes with the receiving papers, a stroke is drawn in black through the red check mark. Referring again to Order 60020, the following is evident at a glance: On Item No. 1, five pieces have been received and invoiced and five pieces are still to come. Item No. 2 has all been received and invoiced. Item No. 3 has been received, but the invoice has not arrived.

Suppose instead of 1-in. iron, 1¼-in. iron had been received in error for Iron No. 3, and such error would immediately be taken up for correction. If anything is returned to the shipper, it is noted on the order as "Item 3a returned for credit—see Bill of Lading No. 1101."

Purchase orders are held in an open or live file until every item is fully accounted for—as Item No. 2 in the illustration — and are then stamped "O.K. to file," and after being posted to the stock book are placed in a dead file.

Local Purchases

Local purchases for food, small items, etc., which are bought at the mine, are made on the same purchase form as is here described. In handling these items the storekeeper acts as purchasing agent. No requisition is made, items being placed directly on the order form and signed by a plant official. These orders have their own series of numbers, and separate files are maintained. Time and paper can be saved on these local orders by placing standing orders for three-month periods for items, as of food, regularly delivered by one supplier. Receiving slips are forwarded to the warehouse by the steward. The steward also checks the monthly invoices and okays the prices and forwards bills to the warehouse.

On local requirements of hardware or other small items, time can be saved by ordering each lot by letter and picking up a counter slip from the dealer. One confirming order is then made to cover one month's deliveries. Local accounts are usually paid by the mine accounting office.

Orders on the Shops

For items made up by the plant's own shops, job or shop orders are made. A typical one is shown (5).

This form is made up in five copies in numbered sequence, two of which go to the machine shop, or other department; one of which goes to the

accounting office; one to a separate warehouse file, and one of onion-skin weight is placed with the stock-book page showing the item.

Invoices covering cost are supplied monthly by the accounting department. These are compiled to cover material and labor used to make the finished article. This should be fairly clear by referring to the form illustrated (5) and to the stock-book illustration which will follow. Finishing work, done by the mine on castings received in the rough from outside purchases, is also handled by shop orders. In this book, the shop order is numbered the same as the purchase order with an "S" prefixed, and the accounting office debit covering the finishing is added to the cost of the items. The process of checking on all orders mentioned is practically identical.

All receiving papers, copies of invoices, correspondence, or any papers pertaining to a particular order, are attached behind such order as soon as checked, and the orders are placed in files as rapidly as disposed of. This is one of the more important features of this system.

Before the receiving procedure is considered, the file that covers incoming shipments should be noted. All invoices, shipping memos, and bills of lading are placed in a filing box at the receiving clerk's desk. These are arranged alphabetically by firms, in folders. Separate folders are kept for those firms making numerous shipments. This file is familiarly called the "dope" box.

If letters are written in connection with credits, shortages, or any exception, an extra thin copy of the correspondence is placed in this box, in addition to the regular file copy, attached to the order. These thin copies are destroyed when adjustments are made.

Supplies Are Received

Receiving. The receiving of material proceeds in the following routine:

A. Freight bills covering each train are obtained from the railroad. The warehouse writes the purchase order number, or numbers, in the corner of each freight bill, as illustrated (6).

The proper order number can usually be determined from the shipping papers in the "dope" box, or by referring to the order index, and it should be on the packages if the shipper follows instructions. The purchase order and all shipping papers are attached to the freight bill and passed out to the receiving desk.

12. Warehouse Invoice Advice

MINING COMPANY No. 3706

WAREHOUSE INVOICE ADVICE

October 14, 1945

Accounting Department:
We have credited your account for the month of October with the following invoices.

Signed.....

NO.	NAME	AMOUNT	C. R. Page
	Total previous credits this month:	$2,000.00	
9220	John Jones & Son	10.00	486
9221	Wonder Coal Company	500.00	482
9222	Ajax Metal	200.00	485
	Total credits this month to date	$2,710.00	

B. A list of cars arriving is made covering each incoming train and is best described by citing the following typical listed item: "Car No.—CP220973; Contents—Coal; Spot—at Yard; For—Coal Plant; Shipper—Crow's Nest; Order—59500; Pro—1197; Weight—90,750." Copies of car lists are sent to the yard-master who will spot the cars; also to any interested department.

C. Now comes the actual checking of freight. On carload lots of a single commodity, such as lumber, coal, or lime, the receiving slip may be made up from the invoice and passed out to the warehouse foreman to have the shipment checked. Usually on such items as coal or lime for which freight bill weights are supplied by sworn weighers, the only check required is to verify the car number and see that the car-door seals are intact. Such cars may be weighed occasionally on your own scales as a test check.

D. Next is the checking of way-freight, consisting of small shipments or carlots requiring detailed checking. The receiving clerk has the freight bill and purchase order and all shipping papers available. He first verifies the packages or pieces with the freight bill, as the car is unloaded.

E. Two forms of receiving slips are used. One, the "Material Receiving Report and Delivery Slip" (7), is in five copies, contained in a duplicating box such as many retail stores use. One slip is filled out and copies are torn off as completed. This form is used for items which are immediately delivered to various departments, a full description being written in. One copy remains with the order; two copies go to the department receiving the material; another copy goes to the yard master who delivers the material. A spare copy is kept in order-number sequence at the receiving clerk's desk. At times, material for some special purpose is held in special storage, and anyone who has a copy of the receiving slip can ascertain that fact by looking at it. When goods are delivered to any department, such department signs for receipt and returns the slip to the warehouse to attach to the order. This method stops a surprising number of claims that material did not arrive and prevents a lot of hunting around.

F. For material which goes into regular warehouse stock, a simple form of receiving slip is used (8).

It is not often necessary to fill out complete details on this slip. If you have a copy of the invoice, or shipping list, the checking may be done on it and your receiving slip will read "as per invoice or memo attached." The party who checks the material makes a check mark after each item, on the duplicate invoice or supplier's shipping list, and shows initials and date at the bottom. Any exception or shortage is noted and investigated at once.

Avoid Congestion

As goods come out of the cars, a considerable amount are despatched at once to the particular section of the warehouse where they will be stored, and the man in charge of

13. Balancing Statements

MINING COMPANY

REPORT OF: WAREHOUSE — MONTH OF: AUGUST

RECORD OF MATERIAL TAKEN INTO STOCK

TRANSPORTATION:			
Freight	$50,849.52		
Express	416.30	$51,265.82	
INVOICES:			
Material	$271,011.94		
Duty	3,853.77	$274,865.71	
LOCAL INVOICES:			
Local invoices paid by Accounting Office	$2,931.33		
Machine shop charges	37,711.90	$40,643.23	$366,774.76

that section checks the items and stores them away. This lessens congestion at the receiving station and insures a better check, as the section-stock clerks are more familiar with the material.

Great care must be used in receiving goods of a technical or intricate nature to see that such items are plainly tagged or marked with description and purchase order number before being stored. Careful marking of goods not easily identified is of great value.

Goods for despatch throughout the plant are checked at the receiving station and are sent out by truck or held for weekly supply train in a section reserved for that purpose.

Enter in Register

G. As soon as goods are checked and receiving slips completed for each shipment, all papers for each order are clipped together and sent to the warehouse office for entry in the receiving register.

The "Receiving and Cost Record," here illustrated (9), has all material entered on it which is received by the warehouse. This record does not detail items. Its main purpose is to list all invoices and freight bills paid, so that the monthly debit to the warehouse is fully accounted for. The procedure of the cost register clerk is as follows:

The receiving papers sent in by the receiving station are usually sorted into freight and express shipments and arranged numerically by the numbers of the freight or express bills.

Check Against Purchase

All items are now checked against the purchase order (4). The invoice amount is entered to the cost record page and both original and duplicate invoices are marked with the number of that page. The amount of freight is added to the duplicate invoice total and the freight or express bill number and amount are shown on the receiving stamp, for invoices (10), as illustrated. The amount of freight is entered in line with the invoice amount on the cost record page, and the two amounts are totaled in the total column. Care must be taken to see that the cost register total is the same as shown on the duplicate invoice.

Invoices are not usually entered to the cost record unless the material has been received. They may be entered if there is only a small item missing and such item is taken up to get adjustment. However, as freight bills usually call for quick payment, it is customary to enter any that appear on the freight statement which have not already been entered. This done, any individual freight bills remaining in the hands of the receiving clerks are marked with the number of the cost register page, so that the freight entry is easily located when the invoice comes along.

Verify Freight Charges

Freight statement amounts are verified with the cost record entries and checked off with a colored pencil, the color being changed for each check-off, so that no confusion results. The warehouse at Flin Flon okays each freight bill as to receipt of the goods only and the city office (in Winnipeg) checks extensions and rates, and later supplies the warehouse with a debit or credit covering any change made from the original amount. Companies should have a good traffic man to check freight rates or otherwise send them to traffic checkers who specialize in such work.

Freight entries will leave some outstanding items of freight, especially at the end of a month, and all these items are rewritten on a new cost-record sheet and carried forward to start a new month. It is best to cut off each month's business with freight bills received a day or two before the end of a month.

After checking the receiving papers against orders, when no invoice is at hand, such papers must be filed in order-number sequence waiting for invoice. The order itself is removed from the papers and placed in the live-order file and again picked up when the invoice arrives.

The net total of invoices and the freight applied to them, in the receiving register, form the exact amount taken into the stock ledgers. Any outstanding freight or invoices will be credited on the general ledger account stores and charged back to the warehouse the first of the following month.

Invoices from the purchasing department are numbered from No. 1 forward throughout the year and transmitted in duplicate to the warehouse, which checks the list (11).

Next, each invoice is checked with the receiving-paper file, and if the material has been received, both copies of it are attached to the receiving papers and handed to the cost-record clerk for entry. Invoices for material still in transit are filed in the "dope" box.

The cost-record clerk removes original invoices, to be returned to the general office for payment, as each is entered to cost-record page, marking the number of the register page on both copies of the invoice.

The original invoices are listed in numerical order on the warehouse invoice advice (12). All items on this form are checked off the purchasing department invoice advice. Any items remaining unchecked at the close of a month's business will be credited on the general ledger account and charged back again to start the next month. By crediting and charging outstanding freight and invoices each month, an exact agreement is reached at the end of each month between the general ledger account stores and the warehouse balance sheet, as will be seen.

Information recorded on a balancing statement appears in illustration (13). Four other balancing statements will appear in the following installment to show how monthly agreement is reached with respect to outstanding freight and invoices.

Trackless Mobile Equipment Reduces Mining Costs

HOWARD O. GRAY, Joplin, Mo.

Installation of trackless, diesel- and gasoline-powered equipment at the Fenix operations in the Tri-State district has speeded up haulage by 25 percent and reduced over-all mining costs 33 percent.

SHORTLY AFTER FENIX & SONS had subleased sheet-ground mines near the Oronogo Circle cave in Missouri, about five years ago, two conditions influenced the installation of trackless loading equipment powered by internal-combustion engines: (1) A manpower shortage, and (2) a grade of ore which demanded low operating costs to permit mining at a profit.

Fortunately, ventilation was not a problem, because large-scale open-pit operations carried on some years ago by Guy H. Waring, manager of the Oronogo Mutual Mining Co., had created favorable conditions in the Oronogo and adjacent sheet-ground mines. Subterranean passages of the old workings connect with the 20-acre open pit by large drifts at the 220-ft. level in the cave. Air circulates from the cave through the workings and forms updrafts at the shafts. Elevation of the present truck roadbed varies from the 220-ft. level to the 245-ft. level, depending upon the dip of the orebody.

As a first step, 1½- and 2-ton trucks with cabs removed and low-sided beds for convenient loading were employed to replace track haulage equipment. Next, air-operated loaders replaced hand shoveling. But these were soon replaced by the crawler-dozer type of loader here illustrated. This is a Hough tractor shovel mounted on a TD-9 International diesel TracTracTor.

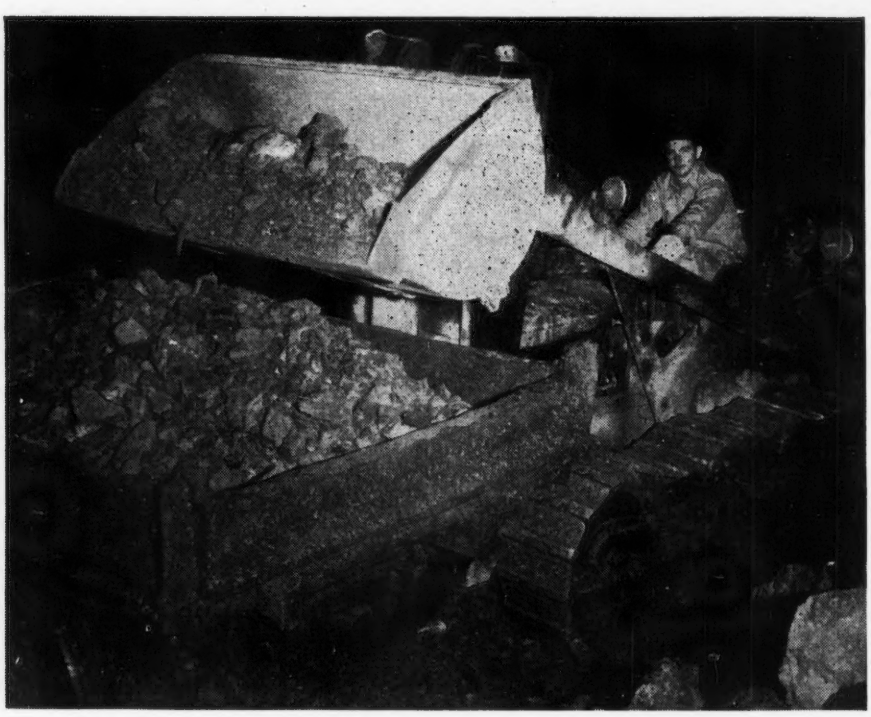
Dimensions of the high-lift, front-end loader bucket are 42x74 in. Edges of the bucket are reinforced with welded steel bands. It is moved up and down on supporting arms by means of ⅝-in. steel cable with pulley connections to drive spools. Clutches and brakes are fully inclosed, and the positive main drive from engine crankshaft to the hoist eliminates chains and belts.

The operator manipulates the

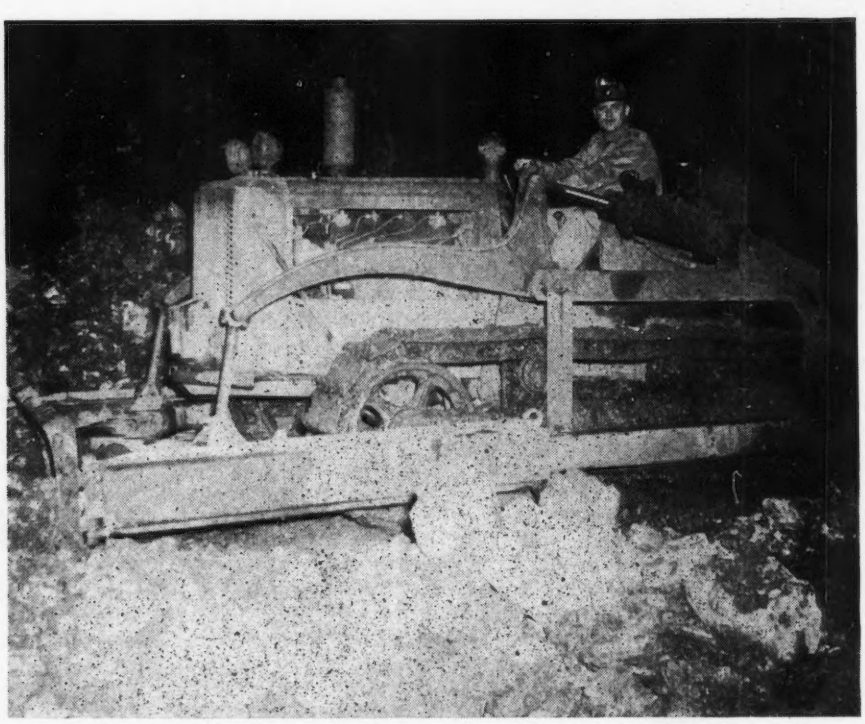
UNDERGROUND DRIFTS connect with 20-acre Oronogo Circle cave, thereby providing ample natural ventilation for gasoline- and diesel-driven equipment used for haulage and loading in adjacent sheet-ground workings.

$5,500 loader in swinging dipper load to truck by brake action on the crawler tread drive. A set of two such rudder brakes, one for the right tread action and the other for the left, are very sensitive to pedal force applied. The loading efficiency varies from 400 to 500 cans a shift, depending on the operator's ability and to a lesser extent on the size or placement of the muck.

With a dipper capacity of about one ton of ore (depending on grade), a truck can be loaded with five cans, or approximately three tons, in an average of two minutes. It does the work of several of the best skilled manual shovelers. Wear on the dipper is great, but it will last about six months with replacement of the reinforced, welded edge once during the period. If loader is in use every day, the treads must be replaced on an average of once every eight months. Consumption of diesel oil is 15 gal. per shift.



TRACTOR SHOVEL DISCHARGES 1-cu.yd. bucket into haulage truck. These loaders handle 250 to 310 tons per shift. Bucket edges are reinforced with welded steel bands.



FROM 300 TO 625 TONS OF SPILLAGE AND "FLY DIRT" (from blasting) are rounded up in neat piles by this bulldozer for subsequent loading by a tractor shovel.

Having already eliminated the necessity of re-laying track in the heading after shooting, with its resultant damage and high maintenance cost, also of stoppages caused by mine-car wrecks and spillage on curves, the management tinkered with the idea of developing some method of picking up wasted ore underground — such as sludge to be found in the bottom of drifts, spillage along trackways, and the fly dirt (from blasting) at the foot of walls and around pillars throughout the mine; all of which had accumulated over a period of years.

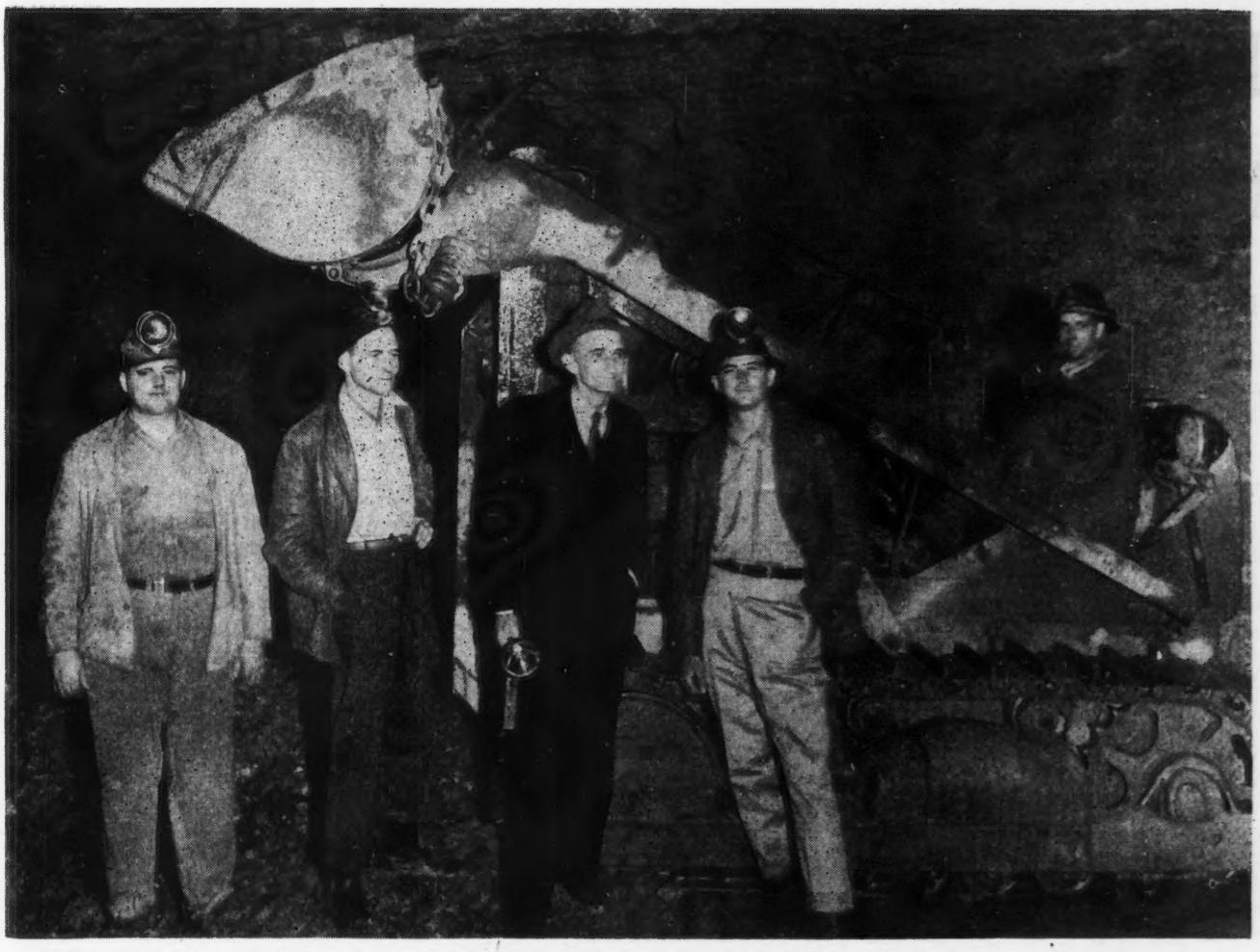
Bulldozer Cleans Drifts

The solution was acquisition of a bulldozer. Approximately $7,500 was invested in the present TD-14 International diesel bulldozer, including a steel blade 14 ft. long and 30 in. high.

Because of its maneuverability, the dozer unit is capable of rounding up in neat little piles some 500 to 1,000 1,250-lb. cans of ore per shift, depending on the depth of sludge and size of rock—from a few inches to a few feet in massed thickness. Ore can be packed in piles up to the very roof if desired, thus varying from 8 to 15 ft. in the sheet-ground mine. Abrasion to dozer blade shown thus far requires replacement of right and left front shoes at the foot of the blade every two months.

Efficient operation of the loader keeps three trucks busy on a short haul, and a fourth could be used when the distance covered amounts to a mile and a half for round-trip from loader to unloading ramp. With added leaves in springs, the trucks are overloaded to haul around three tons. Wear on trucks is severe, and a mechanic is on full time keeping three trucks going, with one in reserve undergoing repairs. Additional spring leaves and extra-duty axles have done away with considerable breakage of these items, but drive shafts remain in the replacement category. The steel lining the truck beds is replaced with 10-gage plates every three months.

By driving backwards, thus reversing the direction of the dozer blade, roads underground are well



DIESEL-DRIVEN, TRACTOR-MOUNTED EQUIPMENT AND TRUCKS were employed by Fenix & Sons to meet manpower shortages and mine ore with grades as low as 2 percent at a profit. Left to right—Harold, Gilbert, Frank, and Thomas Fenix.

graded with milled chats, and tire mileage has been increased considerably. Chats for the grading of the roadways are obtained by dumping from the surface down churn-drill holes to the working level beneath.

Hoist Unloads Trucks

Trucks are unloaded into a hopper by backing them up a ramp with 15 to 20 percent grade. Because of frequent overloads, hydraulic lifts on the trucks were not satisfactory. Instead, a cable is hooked to the head end of the truck bed, which is raised by a V-belt driven hoist powered by a 25-hp. electric motor. The hoist is reversible to permit lowering of the bed after the load has been discharged.

The underground hopper at the head of the ramp has a capacity of approximately 100 cans. It is braced with 4x8-in. timbers covered with 2x12-in. oak boards, which in turn have been lined with 10-gage steel plates. From the hopper chute the ore is drawn into cans for hoisting to the surface. The cans of ore are "bumped" a few feet on mine cars to the bottom of the old Steele shaft, where they are hoisted by the well-known hooker-hoisterman combination, typical of the Tri-State.

Harold, the oldest of the Fenix "boys," contrasts the old with the new methods of mining by pointing out that formerly 51 men were employed, compared with one-third that number, or 17 men, now employed to get the same tonnage.

Low-Grade Ores Handled

However, the ore is lower grade (down to 2 percent having been handled in this operation), and much of it has been obtained without drilling and blasting. It is obvious that when the clean-up of the old workings is completed, more machine men will be required to break enough rock fully to utilize the investment in the diesel equipment.

In addition to considering installation of a "jumbo" drilling unit to go along with its mechanization program, the company installed a larger dipper for the bulldozer to supplement the present loader unit. An expansion of operations will mean greater tonnage to offset any increase in labor, powder, and steel costs.

Haulage Speeded Up

All in all, the elder Fenix son said, underground haulage has been speeded up 25 percent, costs of such have been reduced about one-third, and the over-all mining costs, including the large reduction in the number of employees, have been lowered from 20 to 25 percent.

From this statement, the possibilities of such equipment in the sheet ground of the flooded Webb City area and the Baxter Springs and Picher underground workings of similar grade can be readily visualized once the harmful exhaust gases from diesel power units can be eradicated sufficiently through experimentation and improved ventilation.

New Capital Will Help the Gold Miner

H. L. HAZEN, President, Standard Cyaniding Company, Imlay, Nev.

He can use it to re-equip for operation now that war-time restrictions have been removed.

IN REOPENING the typical gold mine the chief difficulty is usually lack of money. Miners can do almost anything if supplied with enough money. Most gold mines will have to find new operating capital before they can be worked again. Gold mining was stopped in the fall of 1942 by Government order L-208. For two years it was the only business forbidden by executive order.

During the shutdown period the gold miner had to keep his property in repair. Some mines could pull the pumps and equipment, and let the workings fill with water. Other mines had to be kept open, bad ground had to be timbered, and the pumps kept operating regularly. All surface buildings had to be maintained weather-tight, and the water system and power lines had to be kept in working condition.

Further, different Federal agencies put pressure on the closed gold mines to sell any machinery that was needed by mines producing strategic metals for the war, and this equipment had to be sold at a fixed ceiling price. Cost of replacing sold equipment will be from two to five times the price received.

During this period, the gold miner also had to keep up a multitude of reports, which necessitated the hiring of office help. To meet the cost of the work involved many operators spent practically all their available cash, and in some instances more. Today they are in debt. To obtain new operating capital, the gold mine has to show that the profit expected from treatment of ore left in the mine will at least repay the new investment with interest. This calls for a complete survey of ore reserves, new estimates as to operating costs under postwar conditions, a budget showing how the new money will be spent, and when and in what amounts it will be repaid. Small gold mines do not keep large reserves of ore blocked out ahead of operations. A reserve of three to four months is usually considered satisfactory. Most gold miners will have to lean heavily on probable ore in estimating ore reserves left in the mine. A bank would not dare lend the needed operating capital on a loan secured only by the mine. At present the Federal Government would not help to a sufficient extent, and outside money probably would demand at least half the mine for the funds required. Unless some new program is set up, under which the Government will advance the required operating capital, the best remedy would seem to be for the gold miner to subscribe the funds himself. The matter of obtaining capital to reopen the mine is his most difficult problem.

Costs Will Be Higher

In the immediate postwar period the gold miner has to look forward to costs higher than those prevailing in 1940. Everything except gold now buys more paper money than it did before the war. Labor undoubtedly will fight to keep its present dollar income for every hour worked. The gold operator hopes that he will be able to hire skillful miners and millmen, and that they will work harder so that costs will at least be lower than now. One gold property is figuring that costs after the war will be from 10 to 20 percent higher than they were in 1940.

A tax expert will have to be consulted by the operator before he can undertake to promise to repay the new capital at any predetermined rate. If the operator mines all his high-grade ore in an effort to repay the money rapidly, he will most certainly fall into the excess profit bracket and the Government will take 95 percent. The loss sustained in 1943, and possibly the loss in 1944, can never be repaid except out of future new profits on which income taxes must be paid. Repayment of new operating capital should be sufficiently slow, so as to permit its recovery from reserves set aside for depreciation and depletion.

The gold miner hopes for a higher price for his product, but he dare not set up financial estimates based on such hope. According to law he must deliver all his gold to the U. S. Mint, and accept a fixed quantity of paper money for it. He cannot legally sell it to the highest bidder. He cannot even exchange it for goods and supplies. The gold miner has few votes.

If it appears that the gold miner has a property that can stand higher costs with no increase in the paper value of his gold, and the necessary financing has been arranged, the remaining difficulties are management and engineering problems. Incidental to the former, the operator must give considerable thought to the matter of setting up account books and records. A few days' work devoted to this problem may save him hundreds of dollars in costs and a fortune in future peace of mind. In respect to taxation the Federal income tax has one peculiar requirement for gold-mining companies—namely, the costs of the cyanide section of the mill or concentrator must be reported separately from the rest of the operation. Cyanidation costs cannot be included in computation of the depletion allowance of 15 percent of the gross recovery up to 50 percent of the net. No large gold mine has yet fought this ruling in the courts, and a small mine operator has to do what any Government clerk tells him to do.

With all these preliminaries attended to, the gold mine operator can start getting the mine itself into condition to assure an uninterrupted supply of ore to the mill. To restore it to as good physical condition as it was prior to the enactment of L-208, underground workings must first be freed from water, lateral and vertical openings must be cleaned up, and

bad ground caught up. At the mill all machinery will have to be overhauled and properly lubricated. Crushing and grinding equipment probably will have to be provided with new liners to assure a long operating interval before the next periodic shutdown. An experienced mill crew has no difficulty in carrying out the job outlined, and every individual member knows that any careless repairs or adjustments after a long shutdown may result in breakage of expensive machinery.

Expected higher operating costs with a fixed price for gold, both in terms of paper money, will work particular hardships on the operator of a marginal gold property. At the moment he can do but little save to center all his skill on making his operation more efficient. Perhaps there is hope for the gold miner that the Government some day will let him market his gold in a free market, and agree to keep its own gold holdings locked up as tightly as they are at present. If that is ever done, many gold mines should see a profitable old age.

Jumbo for Small Development Drifts

THOUGH THE USE of drill jumbos is considered standard practice in large tunnel and drift headings, relatively few such units have made their appearance in small lateral development openings, where, in general, the time-consuming hand set-up is used. Desiring to simplify and speed up drilling operations in development headings and to provide a practical unit for side-swiping work, the engineering department of Combined Metals Reduction Co., Pioche, Nev., developed the small jumbo shown in the accompanying illustrations, which, according to Sam Arentz, general superintendent, has made it possible to increase the monthly footage driven by as much as 90 ft.

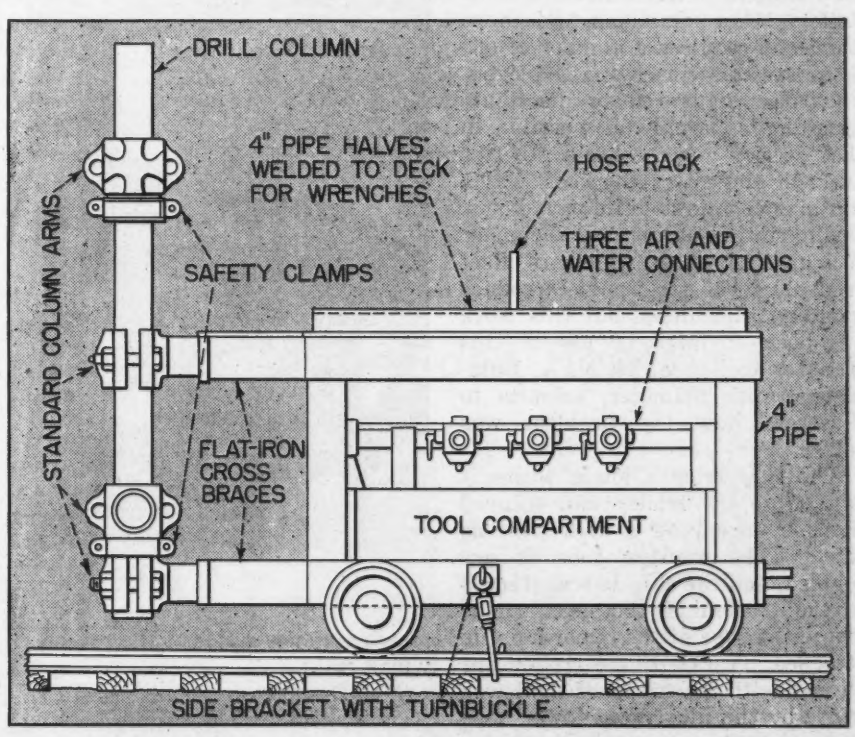
Its outstanding features are simple design and small over-all dimensions, permitting easy transfer from level to level via the shaft cages. Over-all length is 7 ft., width, 4 ft. 6 in., and height, 3 ft. 2 in. Essential parts include a four-wheel truck assembly made from I-beams, and a superstructure composed of 4-in. pipe sections and channel irons. The two standard drill column arms welded to the front end of the truck and top deck structure are braced with welded-on flat-iron crosspieces.

Four Arms Can Be Used

Below the top deck are a tool box and three water and air connections. The upright drill column attached to the two drill arms mentioned previously can accommodate two or more drill arms. When in operation, the jumbo is held securely to the rails by the simple side bracket and turnbuckle hooks shown.

With this equipment, the miner no longer has to pile hoses, drills, steel, and wrenches on an equipment truck after tearing down. He merely coils the hoses on convenient racks, adjusts the position of the machines in the cross-arms, and withdraws the entire assembly from the face.

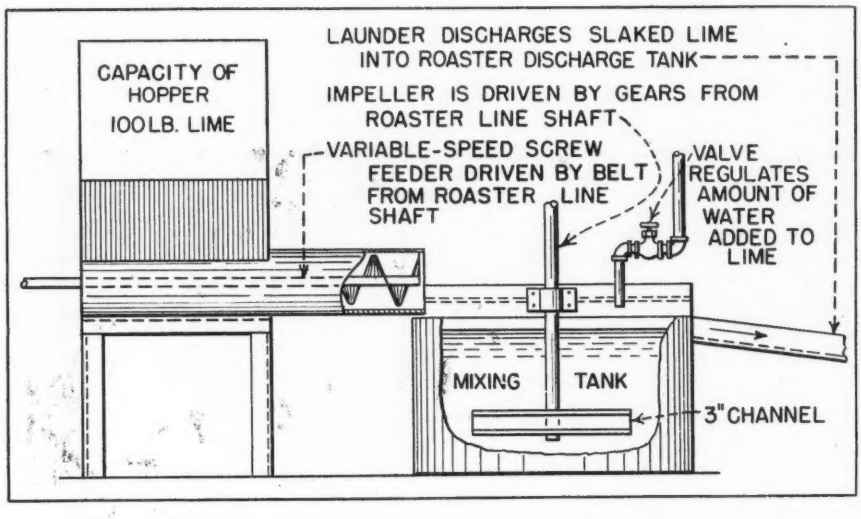
DRILLING FOOTAGE was increased as much as 90 ft. per month with this jumbo.



THE DRILL COLUMN is supported by two standard column arms welded to the truck.

OPERATING IDEAS

Controlled Slaking Reduces Lime Consumption


LAUNDER DISCHARGES SLAKED LIME INTO ROASTER DISCHARGE TANK
CAPACITY OF HOPPER 100 LB. LIME
IMPELLER IS DRIVEN BY GEARS FROM ROASTER LINE SHAFT
VARIABLE-SPEED SCREW FEEDER DRIVEN BY BELT FROM ROASTER LINE SHAFT
VALVE REGULATES AMOUNT OF WATER ADDED TO LIME
MIXING TANK
3" CHANNEL

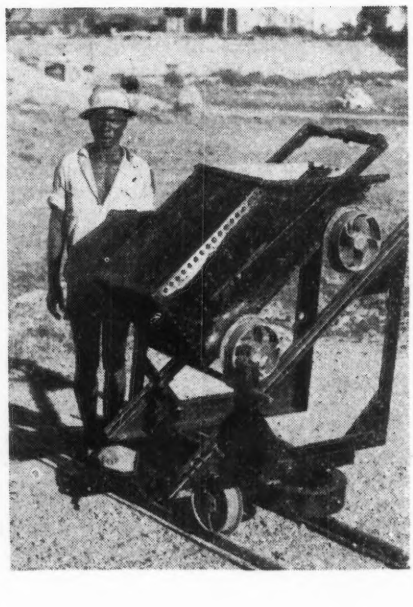
Lime consumption was cut from 100 lb. per ton of roasted pyrite concentrates to 50 to 60 lb. per ton by controlling the slaking temperature at Lake Shore Mines, Ltd., Kirkland Lake, Ontario. The concentrates are discharged from an Edwards roaster into a tank, where they are treated with lime before cyanidation.

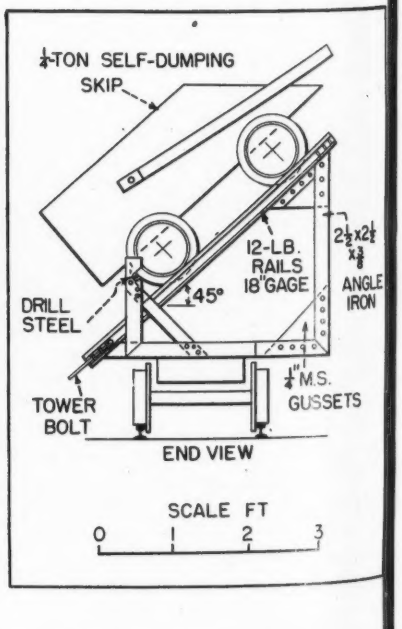
B. S. Crocker, mill superintendent, who submits this information, states titration tests showed that if lime is slaked at temperatures considerably above 100 deg. F., a given quantity will not produce the same degree of alkalinity that the same amount will produce at lower temperatures around 100 deg.

Consequently, with the equipment here illustrated, the lime is fed into a mixing tank at a desired rate by a screw feeder. Water is introduced through a valve and pipe at such a rate that the slaking temperature will be approximately 100 to 110 deg. F. As this is slightly above body temperature, the operators can judge the temperature by feeling the slurry and increasing the flow of water if the temperature rises beyond that range. The lime solution is carried by launder to the roaster discharge tank. Any lumps of lime which may accumulate in the open mixing tank can be removed easily.

Development Rock Handled by Transfer Trolley

Development work at the Golden Valley Mine, Gatooma, Southern Rhodesia, requires a number of offset raises and winzes between levels. They are staggered to distribute sampling as evenly as possible in each section and to obtain a better average picture of the reef, which contains certain definite pay shoots. Ordinarily, hauling development rock up these raises, which are offset from 30 to 50 ft., would introduce handling difficulties, but this work has been obviated by use of this transfer trolley which N. A. Dumbleton, mine manager, submits to illustrate how the problem was solved.

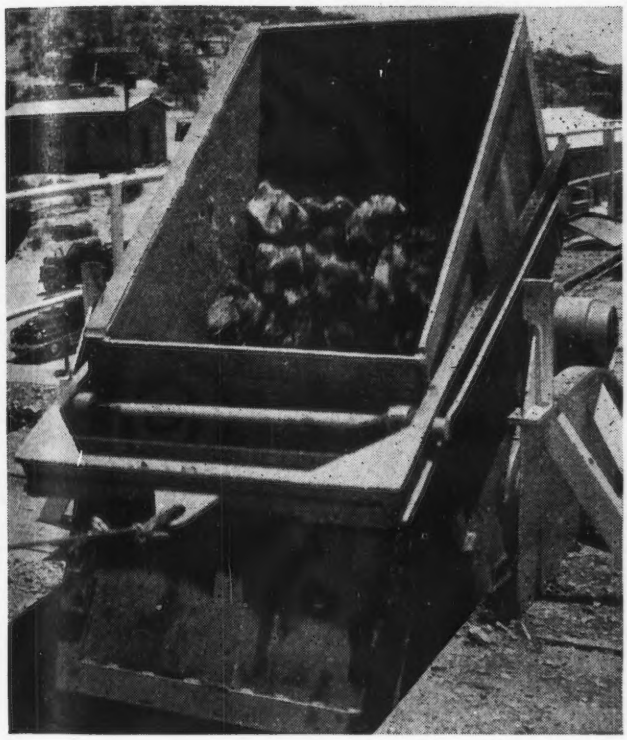


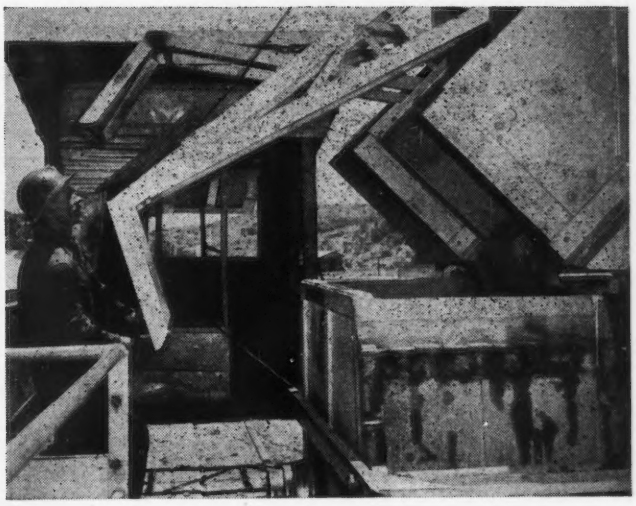


The skip from a lower winze is run on to the trolley and secured there by dropping a drill steel as shown. The haulage rope is uncoupled, and the skip is transferred to the bottom of the next winze, where the rope of the upper hoist is attached. Tracks of the trolley are aligned with the tracks of the lower winze by the illustrated tower bolt, which engages a slot at the top of a winze rail.

Mr. Dumbleton writes that two transfer trolleys are required at the intermediate level, and a pair of points is provided to permit the trolleys to pass. Delay is eliminated by using two skips with the trolleys.

Electric Hoist Powers Self-Dumping Car





SULPHIDE ORE from 10-ton bins at headframe is loaded into 1½-ton car equipped with a dumping device similar to that used on skips in inclined shafts. Loaded car is hauled laterally with electric-powered 7½-hp., double-drum hoist to 175-ton steel transfer bins. Tension on cable causes rear wheels of the car to climb ramp and dump the car as shown in photograph at left. This equipment is installed at the new Mohawk shaft of Mammoth-St. Anthony, Ltd., shown on page 85.

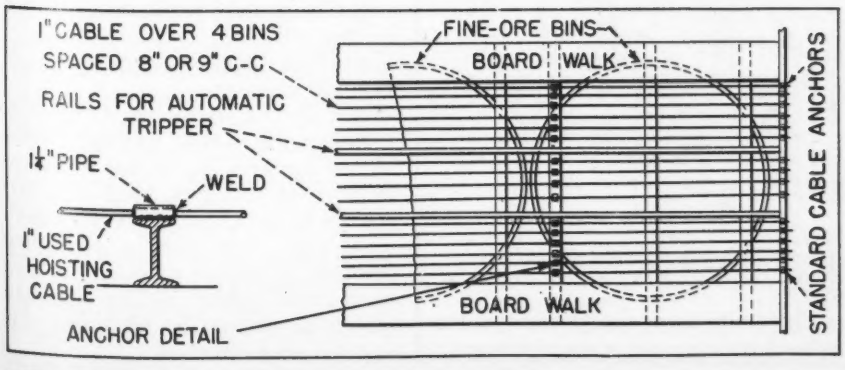
When fire destroyed the headframe of the Mohawk shaft of Mammoth-St. Anthony, Ltd., at Tiger, Ariz., the only steel headframe available as a replacement was not high enough to allow headroom for two 175-ton steel bins into which mine ore was to be dumped. These bins are therefore set up at one side of the headframe over the feeders discharging into a gyratory crusher.

The 1½-ton skips dump into 10-ton bins, from which ore is transferred into the 175-ton bins by a shuttle car of an unusual design worked out by the local staff. The principle involved resembles that used in dumping skips in inclined shafts. However, the skips move on a horizontal track, are loaded from the top, and have an automatic end door.

As shown in the accompanying photographs, the car is drawn back and forth over the bins by a 7½-hp. Sullivan double-drum electric hoist. In one picture the car is being loaded by the operator, using the heavy counterbalanced bin gates. In the other picture, the car is dumping into the second bin.

Flanges on the rear wheels engage the dumping ramps to tilt the car. The first bin's ramps are hinged so they can easily be moved out of the way to let the car go on to the second bin. Note the rollers on the heavy channel-iron bail that passes around the swinging front of the car. When tension on the cable is released, this bail slides down easily and shuts the front door firmly as the car is pulled back upright. The wire rope on the frame leads out to a block and back to the hoist in the operator's shanty. Thus by applying a skip dumping principle to a surface installation the problem of insufficient headroom was solved.

Ore Bin Is Covered With Discarded Hoisting Rope



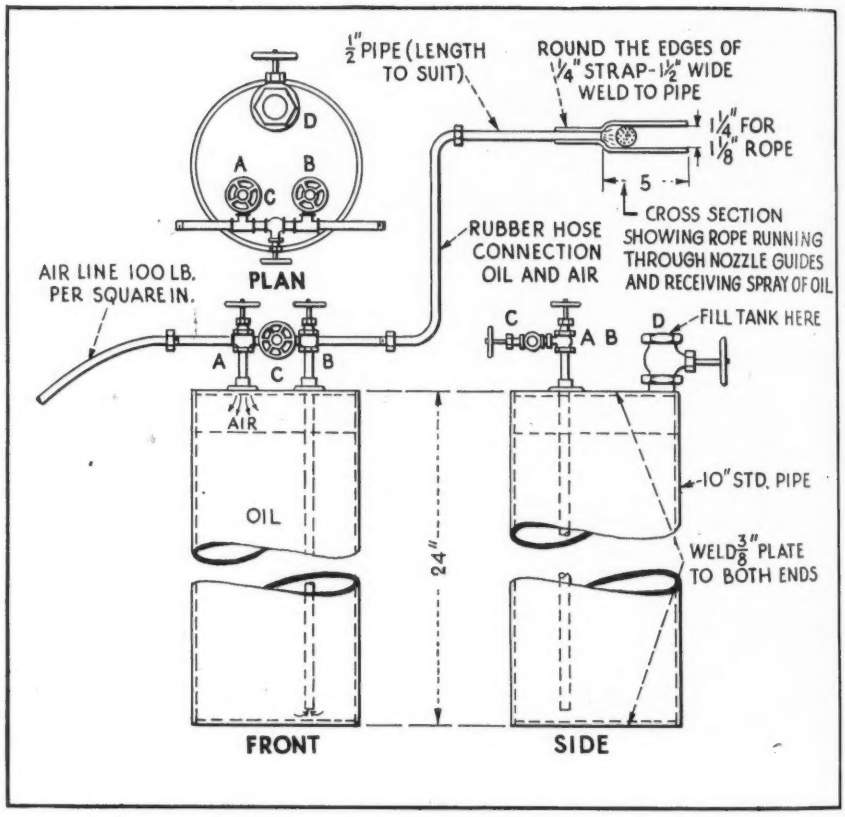
Used 1-in. hoisting rope was strung over the top of eight circular fine-ore bins at the lead-zinc concentrator of Combined Metals Reduction Co., Pioche, Nev., to prevent workers from falling into them. The cables are cut to extend over four bins, and are anchored with standard cable anchors at the ends. To avoid collapse in the event of failure through wear, each cable is welded to every third I-beam by means of a short length of 1¼-in. pipe.

Ropes Lubricated During Hoisting Cycle

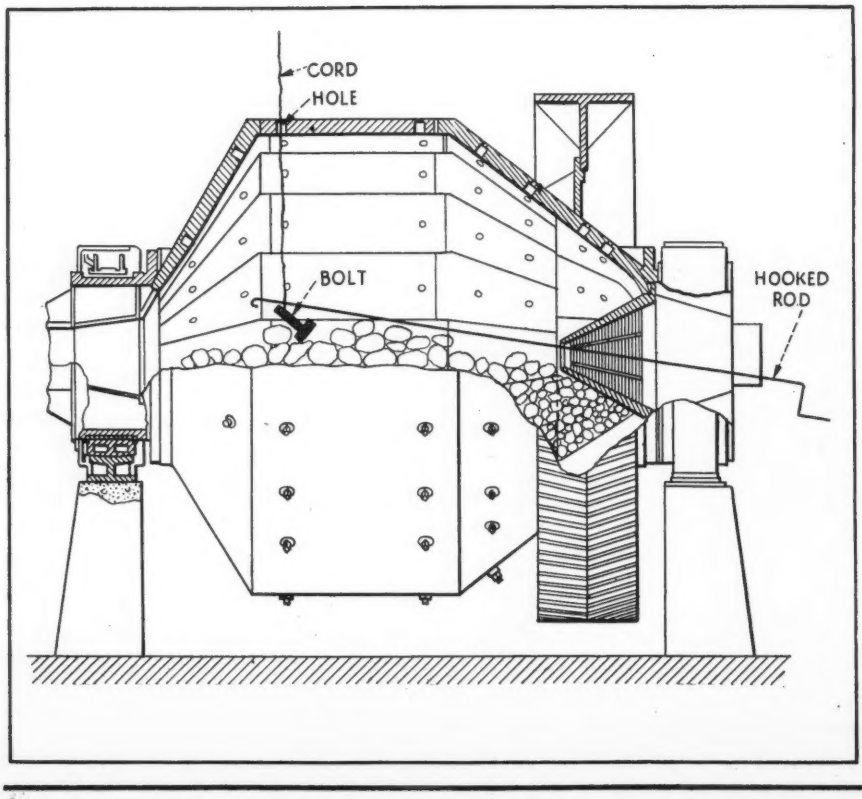
HOISTING OPERATIONS need not be interrupted for rope lubrication if equipment like this is used to apply the oil. Walter Vassar, master mechanic of the Bates mine, an M. A. Hanna property at Iron River, Mich., writes that the illustrated air-operated grease gun has performed rapidly and efficiently.

The equipment consists of a small pressure tank containing lubricating oil and pipe fittings as shown. Valve "A" is a ½-in., 150-lb. angle valve controlling air to the tank. Valve "B" is a ½-in., 150-lb. angle valve to control oil to the line to the spray nozzle. Valve "C" is a ½-in., 150-lb. globe valve to control air to the line. Valve "D" is a 1½-in., 150-lb. globe valve to admit oil to the tank.

Nozzle guides of ¼x1½-in. strap enclose the hoisting rope and permit spraying operations while the hoist is running. Wooden guides may be substituted for the strap guides if preferred. Normally ropes can be lubricated by this air pressure method in two rope trips during any regular hoisting cycle.


½" PIPE (LENGTH TO SUIT)
ROUND THE EDGES OF ¼" STRAP-½" WIDE WELD TO PIPE
1¼" FOR 1⅛" ROPE
5
CROSS SECTION SHOWING ROPE RUNNING THROUGH NOZZLE GUIDES AND RECEIVING SPRAY OF OIL
RUBBER HOSE CONNECTION OIL AND AIR
AIR LINE 100 LB. PER SQUARE IN.
PLAN
FILL TANK HERE
AIR
OIL
10" STD. PIPE
24"
WELD ⅜" PLATE TO BOTH ENDS
FRONT
SIDE

Liner Bolts Replaced Through Trunnion



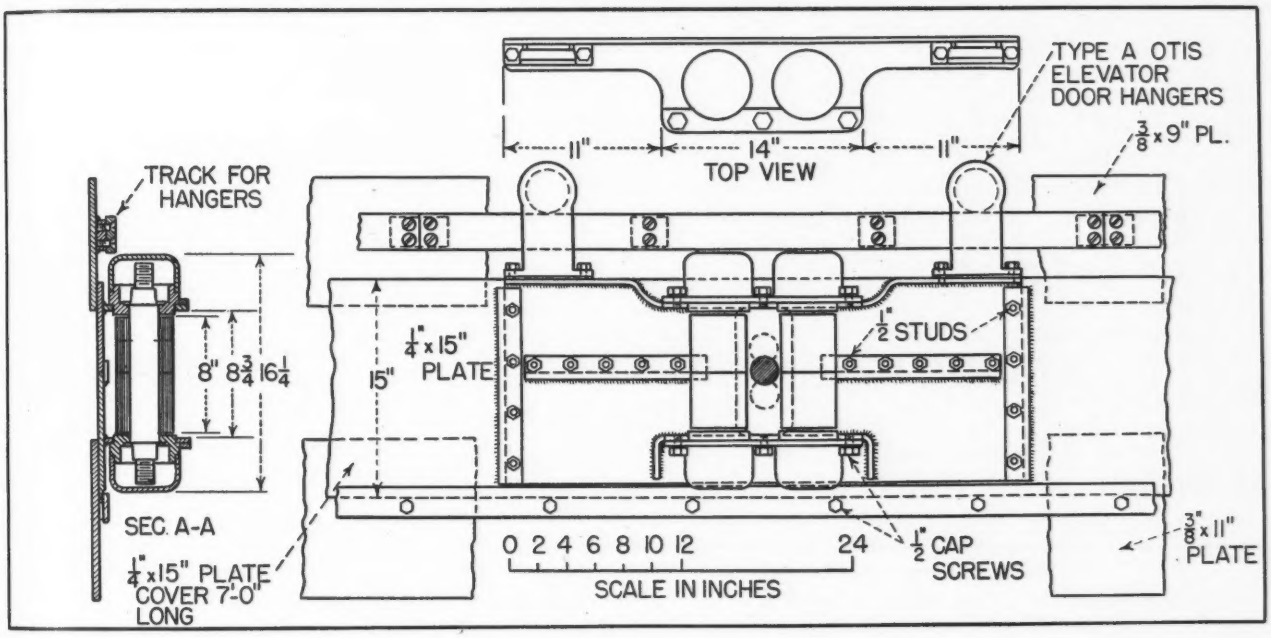
MILL LINER BOLTS may be replaced quickly without opening the mill door by the following method:

1. Turn mill so that bolt hole is on top center.
2. Drop small nut or weight on end of strong light cord into mill through bolt hole.
3. Using hooked rod or tamping stick with nail in end, hook weighted cord out through either trunnion, retaining other end outside mill shell above bolt hole.
4. Tie cord to new bolt near threaded end.
5. Draw bolt back into position in liner recess.
6. Pack gasket, and secure in normal manner.

Mr. Bertrand Robinson, Toronto, Ontario, states that he has used the above method on many types of mills with various feed and discharge devices, including a 5x20-ft. tube mill with only a 4-in. plug opening in center of diaphragm of open face drum feeder through which to work. In all cases this method was effective.

Rope Slide Designed for Trouble-Free Service

Carefully designed details in this rope slide at the new Mather mine, Ishpeming, Mich., are responsible for the trouble-free performance which the equipment has givn thus far. Rubber-covered rollers mounted on roller bearings account for its smooth operation. The moving assembly is suspended from elevator hangers traveling on a steel track. Steel cover plates of ¼x15-in. stock 7 ft. long are attached to both sides of the roller assembly and seal the hoisthouse opening as they slide back and forth with the lateral motion of the rope. The opening in the slide was designed for 1⅞-in. rope.

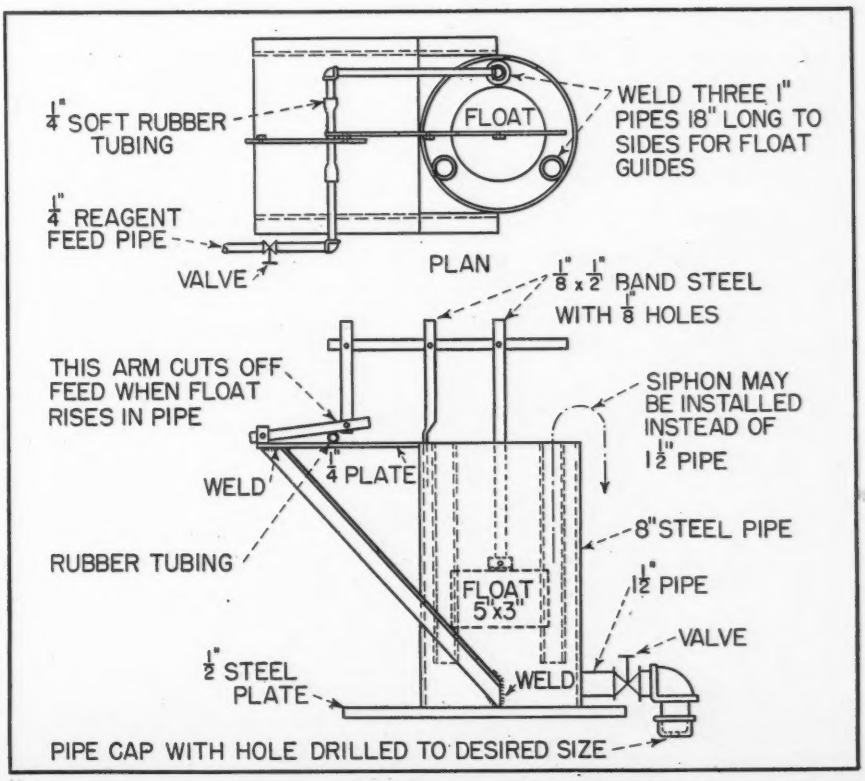


Constant Head Feeder for Caustic Reagents

The illustrated reagent feeder was designed for caustic solutions and found to be superior to cup-and-plunger types. Cost of construction is low because of the simplicity of design.

The lever assembly consists entirely of ⅛x½-in. band steel punched with ⅛-in. holes to permit easy adjustment. The float which operates the levers is so arranged that a constant head is maintained in the tank constructed of 8-in. pipe. If the level of the reagent in the tank rises above a predetermined mark, the float rises and causes an arm to squeeze a soft rubber feed tube, thereby stopping the flow. Conversely, if the level drops too low, the arm on the rubber tube is released to permit flow.

The caustic solution leaves the tank through a short 1½-in. pipe which is fitted with a cap drilled to allow any desired amount of reagent to flow under a specific head. Instead of this pipe outlet, the discharge line may consist of a siphon installed as shown.



MARKET SUMMARY

DESPITE NUMEROUS WORK STOPPAGES resulting from labor disputes in key industries, consumption of major non-ferrous metals during October in civilian products increased moderately. Price uneasiness occurred in foreign copper and some minor metals. However, the E.&M.J. price index advanced from 91.16 in September to 96.40 in October. The recent advance in the price of foreign silver was responsible for the 5.24 point gain.

Interest in copper centered in foreign developments. With South American contracts expiring, negotiations were on as the month ended for an extension of purchases by this country. With normal markets for foreign copper still closed to private industry, and as demand in the United States continues in excess of domestic output, an extension of the buying program is expected, though hardly on a fixed price basis. There were signs of increased competition in moving foreign copper, with representatives of Canadian producers particularly active. Foreign copper has sold at 11.75c., f.a.s. American ports.

Labor difficulties reduced production of refined copper in the United States in September to 45,145 tons. This compares with 69,127 tons in August and 72,995 tons in July. Production of crude during September amounted to 64,369 tons, against 68,253 tons in August and 72,855 tons in July. Fabricators consumed 85,925 tons of refined copper in September. In addition, fabricators used up a fairly large tonnage of scrap and total consumption of copper in all forms probably came close to 100,000 tons. Stocks of refined copper in the hands of fabricators at the end of September amounted to 358,582 tons, which contrasts with the high for this year of 401,530 tons at the end of May.

Though lead is in short supply, larger tonnages are being released to manufacturers of pigments to augment stocks of finished products. A reduction in the use of lead in war materials is more than offset by increased consumption in civilian lines. During November consumers will receive about 24,000 tons of foreign lead from Metals Reserve, which, in addition to obtaining some 40,000 tons from domestic sources, indicates that consumption is holding at a level not far below the peak attained in the

Major Metals

U.S. DAILY AND AVERAGE PRICES

1945 Oct.	Electrolytic Copper: Domestic (a) Refinery	Electrolytic Copper: Export (b) Refinery	Straits Tin: New York	Lead: New York	Lead: St. Louis	Zinc: St. Louis
1	11.775	11.700	52.000	6.50	6.35	8.25
2	11.775	11.700	52.000	6.50	6.35	8.25
3	11.775	11.700	52.000	6.50	6.35	8.25
4	11.775	11.700	52.000	6.50	6.35	8.25
5	11.775	11.700	52.000	6.50	6.35	8.25
6	11.775	11.700	52.000	6.50	6.35	8.25
8	11.775	11.700	52.000	6.50	6.35	8.25
9	11.775	11.700	52.000	6.50	6.35	8.25
10	11.775	11.700	52.000	6.50	6.35	8.25
11	11.775	11.700	52.000	6.50	6.35	8.25
12	Holiday	11.700	Holiday	Holiday	Holiday	Holiday
13	11.775	11.700	52.000	6.50	6.35	8.25
15	11.775	11.700	52.000	6.50	6.35	8.25
16	11.775	11.700	52.000	6.50	6.35	8.25
17	11.775	11.700	52.000	6.50	6.35	8.25
18	11.775	11.700	52.000	6.50	6.35	8.25
19	11.775	11.700	52.000	6.50	6.35	8.25
20	11.775	11.700	52.000	6.50	6.35	8.25
22	11.775	11.700	52.000	6.50	6.35	8.25
23	11.775	11.700	52.000	6.50	6.35	8.25
24	11.775	11.700	52.000	6.50	6.35	8.25
25	11.775	11.700	52.000	6.50	6.35	8.25
26	11.775	11.700	52.000	6.50	6.35	8.25
27	11.775	11.700	52.000	6.50	6.35	8.25
29	11.775	11.700	52.000	6.50	6.35	8.25
30	11.775	11.700	52.000	6.50	6.35	8.25
31	11.775	11.700	52.000	6.50	6.35	8.25
			AVERAGES FOR MONTH			
Oct.	11.775	11.700	52.000	6.50	6.35	8.25
			AVERAGES FOR WEEK			
3	11.775	11.700	52.000	6.50	6.35	8.25
10	11.775	11.700	52.000	6.50	6.35	8.25
17	11.775	11.700	52.000	6.50	6.35	8.25
24	11.775	11.700	52.000	6.50	6.35	8.25
31	11.775	11.700	52.000	6.50	6.35	8.25
			CALENDAR WEEK AVERAGES			
6	11.775	11.700	52.000	6.50	6.35	8.25
13	11.775	11.700	52.000	6.50	6.35	8.25
20	11.775	11.700	52.000	6.50	6.35	8.25
27	11.775	11.700	52.000	6.50	6.35	8.25

THE above quotations for major non-ferrous metals are our appraisal of the important United States markets, based on sales reported by producers and agencies. They are reduced to the basis of cash, New York or St. Louis, as noted. All prices are in cents per pound.

(a) Net prices at refineries on Atlantic seaboard. To arrive at the delivered New England basis add 0.225c. per pound, the average differential for freight and delivery charges.

(b) Export prices are net at refineries on the Atlantic seaboard and include sales of domestic copper in the foreign market. Owing to the World War and the disruption of normal trade relations, our export copper quotations, since September, 1939, have been based largely on f.a.s. transactions, ex United States ports. We deduct .05c. from the f.a.s. basis (lighterage, etc.) to arrive at the f.o.b. refinery quotation.

Copper, lead and zinc quotations are based on sales for both prompt and future deliveries; tin quotations are for prompt delivery only.

Quotations for copper are for the ordinary forms of wirebars and ingot bars; cathodes are sold at a discount of 0.125c.

Quotations for zinc are for ordinary Prime Western brands. Zinc in New York commands a premium over the St. Louis basis equal to the freight differential. Contract prices for High Grade zinc delivered in the East and Middle West in nearly all instances command a premium of 1c. per pound over the current market for Prime Western but not less than 1c. over the *Engineering and Mining Journal's* average quotation for Prime Western for the previous month.

Quotations for lead reflect prices obtained for common lead, and do not include grades on which a premium is asked.

Silver, Gold and Sterling

DAILY AND AVERAGE PRICES

1945 Oct.	Sterling Exchange: "Checks"	Silver (c): New York	Silver (c): London	Gold: London	Gold (d): United States
1	402.000	70.625	44.000	172s. 3d.	$35.000
2	402.000	70.625	44.000	172s. 3d.	35.000
3	402.000	70.625	44.000	172s. 3d.	35.000
4	402.500	70.625	44.000	172s. 3d.	35.000
5	402.500	70.625	44.000	172s. 3d.	35.000
6	402.500	(e)	(e)	(e)	35.000
8	402.500	70.625	44.000	172s. 3d.	35.000
9	402.500	70.750	44.000	172s. 3d.	35.000
10	402.500	70.750	44.000	172s. 3d.	35.000
11	402.500	70.750	44.000	172s. 3d.	35.000
12	Holiday	Holiday	44.000	172s. 3d.	35.000
13	402.500	(e)	(e)	(e)	35.000
15	402.500	70.750	44.000	172s. 3d.	35.000
16	402.500	70.750	44.000	172s. 3d.	35.000
17	402.500	70.750	44.000	172s. 3d.	35.000
18	402.750	70.750	44.000	172s. 3d.	35.000
19	402.750	70.750	44.000	172s. 3d.	35.000
20	402.750	(e)	(e)	(e)	35.000
22	402.750	70.750	44.000	172s. 3d.	35.000
23	402.750	70.750	44.000	172s. 3d.	35.000
24	402.750	70.750	44.000	172s. 3d.	35.000
25	402.750	70.750	44.000	172s. 3d.	35.000
26	402.750	70.750	44.000	172s. 3d.	35.000
27	402.750	(e)	(e)	(e)	35.000
29	402.750	70.750	44.000	172s. 3d.	35.000
30	402.750	70.750	44.000	172s. 3d.	35.000
31	402.750	70.750	44.000	172s. 3d.	35.000
		AVERAGES FOR MONTH			
Oct.	402.558	70.716	44.000	—	35.000
		AVERAGES FOR WEEK			
3	402.000	70.625	—	—	
10	402.500	70.675	—	—	
17	402.500	70.750	—	—	
24	402.750	70.750	—	—	
	402.750	70.750	—	—	

Calendar week averages, New York Silver: Oct. 6th, 70.625; 13th, 70.719; 20th, 70.750; 27th, 70.750.

(e) *Not quoted* (Saturday).

(c) Silver other than newly-mined domestic, by Handy & Harman. Under Treasury order of July 6, 1939, the price on domestic newly-mined silver mined subsequent to July 1, 1939, was fixed at 71.11c. per troy ounce. Handy & Harman's quotation on newly-mined domestic silver 999 fine was 70⅝c throughout October.

(d) U. S. Treasury's gold price. Actual payment by the United States Treasury for gold in domestic and imported ore or concentrate is at 99.75 per cent of the price quoted by the Treasury, which is equal to $34.9125.

war period. The cable industry, manufacturers of pigments, and makers of batteries are the principal buyers. The price situation in lead is strong.

Deliveries of slab zinc in September totaled 41,828 tons, against 48,255 tons in the preceding month. October deliveries will again point upward, totaling around 50,000 tons, trade authorities believe.

The New York Official price of foreign silver was adjusted to 70¾c. an ounce, following recalculation of the handling charges. Demand for foreign silver has not been as active as it was before the ceiling was raised to the same basis as the domestic product.

Quicksilver remained unsettled until it was definitely established that some 12,000 flasks of surplus metal in the hands of the battery industry would be added to the stockpile. The price advanced from $90 early in October to $106 per flask as the month ended.

Miscellaneous Metals Monthly Averages

Average prices of miscellaneous metals for September and October:

(a) New York, packed in cases, in lots of 5 tons or more but less than a carload. (b) Nominal. (c) Producer's price for commercial sticks. (d) Average producers' and platers' quotations. (e) Special shapes sold to platers.

	Sept.	Oct.
Quicksilver, N. Y. flask	95.842	101.385
Antimony (a)	15.839	15.839
Antimony, bulk, Laredo	14.500	14.500
Antimony, bulk, N. Y.	15.265	15.265
Antimony, Chinese (b)	16.500	16.500
Platinum, oz. troy	35.000	35.000
Cadmium (c)	90.000	90.000
Cadmium (d)	92.500	92.500
Cadmium (e)	95.000	95.000
Aluminum ingot	15.000	15.000

E & M J Price Index

Weighted index of non-ferrous metal prices (copper, lead, zinc, tin, silver, nickel, and aluminum). The average for the years 1922-1923-1924 equals 100.

1929	110.33	1937	90.86
1930	82.87	1938	73.67
1931	60.20	1939	77.71
1932	48.26	1940	79.22
1933	59.79	1941	83.49
1934	69.59	1942	86.80
1935	74.66	1943	88.74
1936	73.45	1944	88.74

	1943	1944	1945
January	88.74	88.74	88.74
February	88.74	88.74	88.74
March	88.74	88.74	88.74
April	88.74	88.74	88.74
May	88.74	88.74	88.74
June	88.74	88.74	88.74
July	88.74	88.74	88.74
August	88.74	88.74	88.74
September	88.74	88.74	91.16
October	88.74	88.74	96.40
November	88.74	88.74	....
December	88.74	88.74	....

Miscellaneous Metals, Ores, Minerals

Quotations cover wholesale lots, prompt shipment, f.o.b. New York, unless otherwise stated
(Nov. 1, 1945)

MISCELLANEOUS METALS

Aluminum, ingot, 99 plus per cent, lb.	15c.
Antimony, domestic, spot, lb., 5 tons or more	15.839c.
Bismuth, ton lots, lb.	$1.25
Cadmium, commercial sticks, lb.	90c.
Calcium, lb., ton lots, 97 @ 98 percent, cast	$1.85
Chromium, 97 per cent grade, lb.	89c.
Cobalt, 97 to 99 per cent, per lb.	$1.50
Indium, troy oz.	$2.25
Nickel, electrolytic cathodes, lb.	35c.
Magnesium, 99.8 per cent, carloads, lb.	20½c.
Palladium, troy oz.	$24.00
Platinum (Official quotation) troy oz.	$35.00
Quicksilver, flask of 76 lb., 100 flasks or more	$106.00
Selenium, 99.5 per cent, lb.	$1.75
Silicon, minimum 97 per cent, spot, carloads, lb.	14.75c.
Tellurium, lb.	$1.75 nom.
Thallium, 100 lb. or more, lb.	$12.50 nom.
Titanium, 96 to 98 per cent, lb.	$5.00

METALLIC ORES

Beryllium Ore, 8 to 12% BeO, f.o.b. mine, per unit	$9.00@$10.00
Chrome Ore, per long ton, f.o.b. cars Atl. ports, dry 48% Cr_2O_3, 2.8 to 1 ratio	$41.00
48% Cr_2O_3 3 to 1 ratio	$43.50
Iron Ore, Lake Superior, Lower Lake ports, long ton:	
Old Range bessemer	$4.75
Mesabi bessemer	$4.60
Old Range non-bessemer	$4.60
Mesabi, non-bessemer	$4.45
Lead (Galena) 80 per cent, Joplin, Mo., ton	$76.01
Manganese, Metals Reserve Co. sales price, per long-ton unit of Mn contained, 48 per cent, subject to premiums and penalties, effective May 15, 1944: 85c. (duty paid) New York, Philadelphia, Baltimore, Norfolk, Mobile, and New Orleans; 91c., Fontana, Calif., Provo, Utah, and Pueblo, Colo.	
Molybdenum Ore, 90%, per lb. of MoS_2 f.o.b. mines	45c.
Tungsten Ore, per unit of WO_3:	
Chinese, 60 per cent, duty paid	$24.00
Domestic, 60 per cent and upward	$23.00@$24.00
Vanadium Ore, per lb. of contained V_2O_5 f. o. b. mines	27½c.
Zinc Ore, Prime, 60 per cent concentrate, Joplin, Mo.; per ton	$55.28
(a) Prices at mines, small lots, normally several dollars less.	

METALLIC COMPOUNDS

Arsenic Oxide (arsenic) lb.	4c.
Cobalt Oxide, 70 @ 71 per cent, lb.	$1.84
Copper Sulphate, 100 lb.	$5.00

ALLOYS

Beryllium Copper, 2,5 to 3 per cent Be, per lb. of contained Be	$15.00
Ferrochrome, 65 @ 70 per cent per lb. of Cr contained	13c.
Ferromanganese, 78 @ 82 per cent, gross ton	$135.00
Ferromolybdenum, 55 @ 65 per cent Mo, lb. of Mo contained	95c.
Ferrosilicon, 50 per cent, per lb. of contained Si	6.60@8.10c.
Ferrotungsten, 75 @ 80 per cent, lb. of W contained	$1.90
Ferrovanadium, per lb. of V delivered	$2.70@$2.90
Silicomanganese, 1 per cent C, gross ton	$133.00

NON-METALLIC MINERALS

Asbestos, f.o.b. Canadian (Quebec) mines (U.S. funds), ton:	
Crude No. 1	$650@$758
Crude No. 2	$165@$385
Spinning fibers	$124@$233
Paper stock	$44@$49.50
Shorts	$14.50@$26.50
Vermont, f.o.b. Hyde Park:	
Shingle stock	$62.50@$65.00
Paper stock	$44.00@$53.00
Shorts	$14.50@$28.50
Floats	$19.50
Barytes, f.o.b. mines:	
Georgia, crude, per long ton	$8.50@$9.00
Missouri, 93 to 94 per cent $BaSO_4$, per short ton	$8.25@$8.50
Bauxite, long ton:	
Domestic, crude, 50 @ 52 per cent (not dried)	$5.00
Domestic, chemical, 55 @ 58 per cent	$7.50@$8.50
Domestic, abrasive, 80 @ 84 per cent	$16.50
China Clay, f.o.b. mines, ton:	
South Carolina and Georgia, No. 1, bulk	$6.75@$8.00
Delaware, No. 1	$15.00
Feldspar, bulk, ton:	
Potash feldspar, 200 mesh	$17.00
Glass spar, white, 20 mesh	$11.75
Fluorspar, f.o.b. mines, bulk, Kentucky and Illinois 60 per cent, all rail movement, ton	$30.00
Acid 98 and 1 per cent, bulk, ton	$37.00
Fuller's earth, f.o.b. Georgia or Florida, ton	$7.00@$14.00
Magnesite, per ton dead-burned, f.o.b. Washington	$22.00
Mica — Colonial Mica Corp., agent for Metals Reserve Co., quoted full-trimmed ruby muscovite domestic, April 1 to Sept. 30, inclusive — No. 1, $1.70 to $36.65 per lb., depending on size; No. 2, $1.25 to $26.00; No. 2 Inferior, 50c. to $16.00; No. 3, 25c. to $6.25. Prices f.o.b. nearest producer's rifting plant.	
Ocher, Georgia, ton	$19.00@$22.00
Pyrites, Spanish, per long ton unit of S, c i f. Atlantic ports	12c. nom.
Silica, in bags, 325 mesh, ton	$20.00@$40.00
Sulphur, Texas, mines, long ton	$16.00
Talc, f.o.b. works, ton:	
New York, double air-floated, 325 mesh	$12.00@$15.00
Vermont, extra white, 200 mesh	$9.50@$10.50
Tripoli, Missouri, ton:	
40 mesh, cream colored	$14.50

IRON AND STEEL

Pig Iron, Valley furnaces, gross ton: Basic	$24.50
Steel, base price, Pittsburgh Billets, gross ton	$36.00
Structural shapes, 100 lb.	$2.10

WASHINGTON REFLECTIONS

McGRAW-HILL WASHINGTON NEWS BUREAU

New Stockpile Bill Arouses Controversy

A new stockpile bill (p. 71) has been introduced by Senator Johnson, of Colorado. Many proponents of adequate provisions for stockpiling of strategic minerals and metals for purposes of national defense do not like the measure proposed by Senator Johnson.

The bill would set up a stockpile board consisting of a chairman and the secretaries of Agriculture, Commerce, Interior, Navy, State, and War. The chairman would be chosen by the head of the agency designated by the President to handle the stockpile program. All materials to be stockpiled, and the amounts, would be determined by the President.

Material no longer considered appropriate for stockpiling could be disposed of simply by publishing a statement of intent in the Federal Register. A safeguard clause simply requires due regard for protection of the Government against loss and protection of producers, processors, and consumers against avoidable disruption of markets. This clause could be easily circumvented on account of the looseness of the phrase "due regard." Power to act would be between the President and the chairman, the members of the board being advisory and assistant.

Hearings on the Johnson bill were held Oct. 30 on short notice before Senator O'Mahoney, chairman of the surplus property subcommittee of the Senate Committee on Military Affairs. The hearings lasted only one day. C. K. Leith, of WPB; Alan Bateman, of RFC; and representatives of the Army and Navy recommended stockpiling and purchase of materials from foreign sources. E. W. Pehrson, U. S. Bureau of Mines, dwelt on the mineral position of the U. S. (E.&M.J., March, p. 108). Julian D. Conover, American Mining Congress, called for additional curbs on Executive power to declare material obsolete for stockpiling and to dispose of such material.

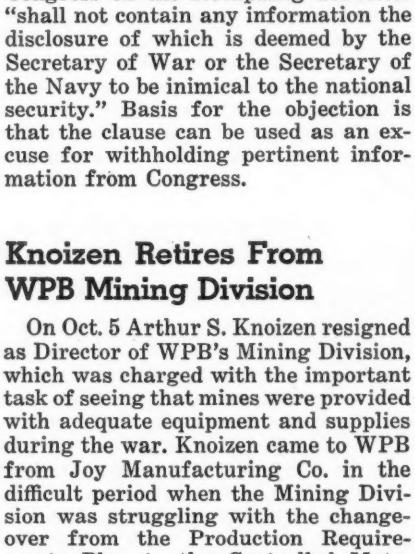
Critics of the bill are not satisfied with the protection it would give industry against dumping of Government stocks. They point out that material can be declared unnecessary at the will of the Executive, or his deputies, and then sold. In a weak market the dumping of large tonnages would make it impossible for the Government to recover a reasonable amount of its original purchase price. It also is possible that the easy method of disposal provided in the bill could be used as a weapon against legitimate business if it were placed in the hands of unscrupulous bureaucrats.

Critics of the proposed stockpile bill believe that it would be possible for the Government to procure large quantities of foreign metal and minerals, and, after importing them for the stockpile, presumably without duty, to sell these materials on the domestic market. By waiving the Buy American Act, the bill relieves the proposed stockpile board from any obligation to favor domestic sources of supply.

Objection also has been raised to the provisions that the annual reports to Congress on the stockpiling activities "shall not contain any information the disclosure of which is deemed by the Secretary of War or the Secretary of the Navy to be inimical to the national security." Basis for the objection is that the clause can be used as an excuse for withholding pertinent information from Congress.

Knoizen Retires From WPB Mining Division

On Oct. 5 Arthur S. Knoizen resigned as Director of WPB's Mining Division, which was charged with the important task of seeing that mines were provided with adequate equipment and supplies during the war. Knoizen came to WPB from Joy Manufacturing Co. in the difficult period when the Mining Division was struggling with the changeover from the Production Requirements Plan to the Controlled Materials Plan. His executive skill and broad background in the equipment field proved invaluable in keeping the mines supplied and in rationalizing the functions of his division. He returns to his company deserving the gratitude of the entire mining industry for a job well done.



A. S. KNOIZEN

New Bill to Raise Silver Price to $1.29

Silver is again in the limelight. The Green Act, providing for sale of Treasury "free" silver at 71¢ per ounce, expires Dec. 31. Senator Green, responsive to the desires of New England silversmiths, has introduced a bill to renew the Act for two years.

The silversmiths, who have a broad demand for their products from a well-heeled and inflation-conscious public, have abandoned their violent opposition to high silver prices in view of their interest in obtaining access to all the raw material they want. Their demands, added to other silver requirements, have pushed the world silver price up to the 71¢ level at which the Green Act authorizes disposal of Treasury silver.

To take advantage of the interest in supply rather than price, Senator McCarran has introduced a bill (S-1486) calling for raising the Government purchase price of silver to $1.29, less charges, and repeal of the provisions in the Silver Purchase Act which give the President power to expropriate silver and which impose a 50 percent tax on profits from private silver transactions. The $1.29 figure has been the melting point of United States silver dollars ever since the first coinage statute, in 1792.

High Officials Plead for Retention of War Controls

John W. Snyder, director of the Office of War Mobilization and Reconversion, recently told the House Judiciary Subcommittee, at hearings on the Second War Powers Act, that retention of the President's power to extend certain war-time controls is essential for orderly reconversion from war to peace. Revocation of the war controls at this time would be a serious threat to the Administration's program, he informed the committee on Oct. 26. He emphasized that the Army shares the view that the Government cannot safely proclaim that hostilities have ended. Bills now before the committee would fix the legal end of hostilities on either Aug. 14 or Sept. 2. Controls in many cases would end six months after hostilities end officially.

The power to allocate and conserve on essential materials is obtained through Title 3 of the Second War Powers Act. Mr. Snyder declared it is impossible to predict accurately when existing shortages will end. He specifically named tin and lead as among the critical items.

John D. Small, head of the Civilian

Production Administration, also pleaded for the retention of war controls for an indefinite period. He pointed out that lifting controls on tin before supplies are adequate would result in the rapid dissipation of stocks. Careful husbanding of stocks and constant effort to increase imports is essential, he said. In the production of automobiles, Mr. Small declared, strict conservation of tin has brought down the use of the metal from about four pounds a car to less than two pounds. It would be dangerous in the extreme to discontinue tin control before supplies are adequate, and gradual relaxation of the regulations will have to be practiced throughout the transition period.

Lead is another material now in short supply, Mr. Small told the committee. Present estimated 1946 supply is about 850,000 tons, of which 100,000 tons will consist of imported metal. If the restrictions on lead were removed, he believes that demand would probably rise to as high as 1,100,000 tons. Meanwhile, stocks owned by the Government have dropped from a high point of 276,000 tons at the beginning of 1943 to an estimated figure of only 88,000 tons on Jan. 1, 1946. Mounting European requirements will make imports into this country increasingly difficult.

House Cuts USBM Budget for Exploration and Research

Among other cutbacks in fiscal 1946 appropriations made as a result of the end of the war, the Administration recommended cutting Bureau of Mines funds for exploration and pilot-plant operation from $5,350,000 to $4,000,000.

When the House Committee on Appropriations considered the rescission bill, H.R.4407, some remarks made in committee led industry representatives and the Bureau of Mines to believe that a deeper cut was intended. Accordingly, the Bureau shut down several exploratory and pilot-plant operations, not simply to the level indicated by the Administration recommendation, but much more drastically. The natural result was an outcry from the "grass roots" which brought a delegation of Congressmen before the committee protesting the proposed cutback. Also, Congressman Engle, of California, made a vigorous speech to the House, strongly supporting Bureau exploration and research.

These maneuvers succeeded in smothering any committee impulse to cut below the recommended level, and the committee stayed with the reduction proposed by the Administration. So also did the House, which passed the rescission bill in late October.

Bureau appropriations for exploration and pilot-plant operation (only) since 1940 are as follows: 1940, $350,000; 1941, $2,625,000; 1942, $3,385,000; 1943, $8,047,000; 1944, $11,500,000; 1945, $10,145,000; 1946, $5,350,000 (cut by House to $4,000,000).

No Early Relief Seen From Tin Shortage

Accurate estimates of the Far East tin supply may be made available before the end of the year if present plans materialize. There are indications that substantial quantities of tin may still be found in English and Dutch territory, but there also are indications that the quantity reaching this country will be small and will be slow in arriving.

Little difference, if any, in tin allocations may be expected in the months immediately ahead. The British appear to be reluctant to ship tin found in that territory. One reason given is that the Japanese-smelted tin may not come up to the Straits' standards.

Negotiations with the British are under way, but judging by the testimony of representatives of the State Department at the special hearings on tin, little progress had been made up to the time the hearings were held. It appeared that the conversations might drag along for some time before it would be definitely known how much of the tin would be sent to this country and how soon it would arrive.

The tin captured in Germany early this year arrived in the United States only recently. This would indicate a period of more than six months before deliveries could be expected from the Far East if shipments were handled promptly. There are so many possibilities of delay that realistic Washington observers believe it will take much longer for Far Eastern tin to arrive.

According to one report, some 17,000 tons of tin were found. This find created little excitement in official circles. Everyone was pleased, but 17,000 tons is less than one month's world consumption and less than two months' consumption in the United States at current rates. Later, considerable doubt existed on the accuracy of the tonnage mentioned. Whether the find was large or small, authorities here are expected to dole out new supplies with the greatest care.

New Revenue Act Will Reduce Wartime Taxes

House and Senate versions of the bill hurried through Congress to assure tax relief to both corporations and individuals were not greatly different. Accordingly, the conference committee had little difficulty in ironing out a compromise, which was sent to the President on Nov. 1.

The final bill repeals the capital-stock, declared value excess profits, and automobile stamp taxes. Individual taxes are lessened by raising individual exemptions to $500 per person, cutting surtaxes by 3 percent (of taxable income), and by a 5 percent reduction in the over-all tax. Corporation taxes are reduced from 40 to 38 percent, with additional benefits for those showing less than $50,000 income. The excess profits tax is repealed, with a one-year retention of the carry-back of credits.

Ordinarily, a conference committee is expected to stay between the extremes established by the two houses. However, although the House had voted to repeal the high special wartime excise taxes and the Senate voted to do the same six months after the end of hostilities, no reductions were made in this field except repeal of the auto tax.

Premium Plan Is Slated To Expire Naturally

Government policy on metal prices and the continuation of the Premium-Quota plan had not been defined in late October. Unofficial opinion, however, is that the premium prices will continue to be paid until the present law expires on June 30, 1946. Washington opinion is against continuance of subsidy payments beyond the end of the present fiscal year. From a political standpoint, subsidies in general are unpopular. It is doubtful if Congress will undertake legislation either to extend the Premium-Quota plan or to terminate it sooner than provided in legislation now on the books.

The feeling in OPA in regard to the price ceilings on copper, lead, and zinc is that they should be taken off when premium payments stop. This feeling is shared elsewhere by Government officials and on Capitol Hill as well.

It has been suggested that the ceiling prices of copper, lead, and zinc be removed the first of the year, which would permit the prices to move freely for six months before premiums are discontinued. This would mean that by next July few mines would be operating under the Premium-Quota plan, assuming that the metal prices would go up in a free market.

Bills Would Compensate For Gold Mine Losses

Identical bills have been introduced in both the House and Senate to provide relief for owners of certain gold mines closed as a result of WPB's controversial order L-208. Senators Murray, Hayden, McFarland, and Taylor are sponsoring the bill in the upper chamber. Congressman Engle has introduced it in the House.

Briefly, the bill contemplates payment of out-of-pocket loss and the expense of restoration of the mines to the condition they were in when L-208 forced them to close.

Claims under this act would be investigated by an examiner appointed by the Secretary of the Treasury. Claims found to be qualified would be certified by the examiner for payment by the Secretary of the Treasury. Settlement must be made within one year after filing of the claim. Provision also is made in the bill for court review of any decision of the examiner.

NEWS OF THE INDUSTRY

Eagle-Picher Labor Case Ends After 10-Year Fight

The C.I.O. and National Labor Relations Board accepted $250,000 on Oct. 9 in final settlement of a 10-year fight against the Eagle-Picher Mining & Smelting Co., and Eagle-Picher Lead Co., largest operators in the Tri-State lead and zinc field.

All charges of unfair labor practices against the companies were dismissed in an agreement filed in the United States Circuit Court of Appeals at St. Louis in which the union and NLRB also abandoned the contest to collect over a million dollars in back pay for 209 miners who struck in 1935.

The case was one of the first brought under the NLRB act, arising out of riots and violence which flared up in 1935 and required national guard units of Oklahoma and Kansas to maintain order. The mines were reopened under patrol.

When the strike was called by the International Union of Mine, Mill and Smelter Workers there was no dispute as to wages, hours, or working conditions. Subsequently violence resulted between members of the C.I.O. union and members of the "Blue Card" union, alleged to be company dominated by the C.I.O., but which later affiliated with the A.F.L. The union claimed a membership at the time of the strike start of 3,500 to 4,000 of the 6,000 workers in the district. The total vote in the strike, according to NLRB numbered 7,000.

More than 300 members of the C.I.O. union persisted in the strike, and the NLRB in 1935 initiated proceedings on their behalf against the Eagle-Picher companies. The trial was begun before a board examiner at Joplin, Mo., Dec. 6, 1937, and continued to April 29, 1938. A Congressional Committee inquired into the operations of the hearing later and returned a report of alleged irregularities. The NLRB found against the company on Oct. 27, 1939, and ordered the jobs of the strikers restored and that they be paid back wages. The companies appealed the order to the Eighth Circuit Court of Appeals. A decree of enforcement of the NLRB order was issued by the court June 27, 1941. The order contained the board's formula for computing back pay.

Alleging that a "mistake" has been made in its devising of the formula in that it would yield only about $200,000 instead of $800,000 for the strikers, the board filed a petition with the court Feb. 4, 1943, to vacate the decree as to the back-pay award. The court denied the petition and the union appealed to the United State Supreme Court. There the opinion of the lower appellate court was upheld May 28 by a 5-to-4 decision, and the agreement for the $250,000 settlement followed.

On Aug. 30, 1941, the company complied with the board's order by sending invitations to approximately 200 workers to return to their jobs which they had left six years before. The board claim was that the back-wage award should total about $800,000 plus interest at 6 percent a year, a total of more than a million dollars. When the formula was applied, it yielded only $200,000 and the company insisted the decree was final. The $250,000 settlement is without interest. The company also agreed to pay court costs of the union up to $1,500.

Tennessee Iron Company To Restore Two Slopes

Plans further to develop sources of raw materials for the Tennessee Coal, Iron & Railroad Co. in the Birmingham district have been announced by Robert Gregg, president, and will include the restoration of two iron ore slopes at mines Nos. 8 and 13 which have been out of action for several months. Additional working places will be opened in all ore mines. Capacity in the limestone mine No. 5 and the dolomite quarry at Dolonah will be raised through the addition of mining and quarrying equipment.

The program will also include the opening of a new coal mine in the American seam in the Concord area, installation of a new battery of 63 modern coke ovens at the Fairfield Coke Works which will replace older batteries, and the construction of an additional open-hearth furnace at the Fairfield Steel Works which will raise the company's steel ingot capacity 120,000 tons per year.

Coeur d'Alene Companies Sign Wage Contracts

Wage and working agreements covering a period of two years have been signed by 22 mining companies in the Coeur d'Alene district and officials representing the Wallace, Kellogg, and Mullan locals of the United Mine, Mill & Smelter Workers Union, a CIO affiliate. The contract expires June 30, 1947, and is retroactive to July 1, 1945.

New clauses appearing in the contract which differ from the former agreement include the following: The lunch hour period for underground workers is to be considered as time worked and is retroactive to July 1.

Under a plan of hospitalization, the mining companies will contribute $1 per month on the premium of any worker who takes out a policy to cover the costs of operations and hospitalization of all members of his family.

Employees will receive overtime for any work performed in addition to any eight-hour shift or after 40 hours in any one week.

After July 1, 1945, vacation pay shall include shift premiums.

Four hours "show-up" pay will be allowed workers appearing for work and for whom no work is provided.

The contract recognizes the workers' right to organize and to maintain their organization.

The seniority clause in the contract was clarified and provision inserted allowing accumulated seniority to former employees returning from military service.

Under the terms of the contract the union agrees "that for the duration of this contract there will be no strikes, stoppages of work or unavoidable interruptions of production." The mining companies agree that there shall be no "lockouts" during the same period.

Following are the standard wage rates of the Coeur d'Alene mining district as officially established by a Government-appointed arbitration board headed by a special investigator, Verner E. Wardlaw, and which became effective on Oct. 5, 1944:

Mine Workers	
Miner	$8.25
Drift miner	8.75
Raise miner	8.75
Timberman	8.75
Timber repair man	9.00
Mucking machine operator	8.25
Trackman	8.25
Blacksmith	9.00
Shaft repairman	9.25
Driver heavy truck	8.25
Driver light truck	8.00
Watchman	8.00
Mill Workers	
Flotation operator	$8.50
Mill labor inside	7.75
Sawmill Workers	
Head sawyer	$8.75
Sawmill operator	8.00
Sawmill helper	8.00
Sawmill labor	7.50
Smelter Mechanical Workers	
First class	$8.75
Second class	8.25
Helpers	7.75
Oilers	8.00
Sample Mill Workers	
Millman helper	$7.75
Crusherman	8.00
Sample cutter	8.00
Ore loader	7.75
D-L Roaster Workers	
Clean-up labor	7.50
Inside plant labor	7.75
Inside clean-up labor	7.50
Blast Furnace Workers	
Craneman	$8.25
Hopperman	7.75
Matte breaker	7.75
Baghouse operator	8.00
Lead Refinery Workers	
Craneman	$8.25
Dry Ore Antimony Workers	
Working shift boss	$8.50
Operators	8.00
Helpers	7.75
Antimony casters	7.75

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EXIDE IRONCLADS KEEP TRAMMERS PULLING STEADILY AND STRONG . . .

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Mining Men Observe International Mining Day In Three-Day Celebration at El Paso, Texas

Speakers Discuss Reconversion, Stockpiling, and Government Controls — Bright Outlook for GI in Mining Field Is Cited — After-Effects of Atomic Bomb Demonstrated

More than 700 mining men and their wives attended the International Mining Day meeting held in El Paso on Nov. 1, 2, and 3, which was sponsored by the El Paso Chamber of Commerce, numerous mining concerns and the El Paso Section of the A.I.M.E.

The celebration was devoted to technical discussions, displays by various manufacturers, discussions of present problems of the mining industry, and entertainment for the visitors.

In an evening address following registration on Nov. 1, Dr. D. M. Wiggins, president of the Texas College of Mines and Metallurgy, discussed "Postwar Education and the GI," stating that the returning GI has a wonderful opportunity in the mining field with proper education. He added that his college was stream-lining mining courses to conform with postwar conditions. There are untold vacancies in the mining and metallurgical field, he stated, because of the sharp drop of mining students since the war started.

Mining visitors were feted with a Ranch Style breakfast served in the Victory Room of the Chamber of Commerce Building on Nov. 2. Thereafter the meeting was officially opened at Hotel El Cortez, with Dean E. M. Thomas of the Texas College of Mines as general chairman.

F. H. Hayes, deputy vice chairman for metals and minerals of the War Production Board, spoke on wartime achievements and reconversion outlook of WPB. Citing the tremendous demand for metals in civilian products, Mr. Hayes urged the same degree of resourcefulness for peacetime production as was displayed during the war. He expressed the hope that the reconversion would be so well advanced by mid-1946 that ceiling prices and subsidies on copper, lead, and zinc could be removed and that the industry would revert to private enterprise.

Growth in supply of industrial raw materials from 1939 to 1944 is illustrated by the following increases which he mentioned: magnesium, more than 3,300 percent; aluminum, more than 400 percent; copper, 72 percent; steel, 86 percent.

In regard to disposition of accumulated stockpiles of raw materials, Mr. Hayes reported that progress in reconversion "will determine the time at which the insurance stocks accumulated during the war can be transferred to the postwar strategic stockpiles." Reconversion stocks are now used to supplement domestic deficiencies only, he stated, and concerted efforts are being made to prevent dumping excess stocks on the market. Importation of tin, lead, and antimony is now necessary because these metals are in short supply.

He pointed out that current conditions do not permit complete removal of government controls, because of labor shortages in the mines and the danger that hoarding of tight metals might bottleneck reconversion progress.

Robert S. Thomas, representing Harvey S. Mudd, president of A.I.M.E., addressed the mining visitors, stating that at present the mining industry needs at least 10,000 men to fill existing vacancies. He foresees a bright outlook for the mining industry in the postwar era, and believes that firm metal prices will continue to hold.

E. C. Anderson, representing Governor Dempsey of New Mexico, and Robert S. Palmer, of the Colorado Mining Association, brought greetings from their respective states.

Charles H. Dunning, representing Sidney P. Osborn, Governor of Arizona, told delegates the mining industry needs "a steady and fairly priced market that lends sufficient incentive for continued exploration and research, which in turn brings not only new discoveries but technological improvements that continually enable us to obtain lower operating costs, so that we can consequently operate lower grade and larger deposits."

Other visitors introduced were Arturo Pena, representing Governor Blas Martinez of Durango, Mexico, and Enrique Muller, representing Governor Fernando Miramontes of the State of Chihuahua, Mexico.

On the morning of Nov. 3 the visitors inspected B-29 bombers at Biggs Field under the guidance of Col. John R. Kane. In the afternoon guests visited the Texas College of Mines. Later Dr. W. W. Lake, head of the Chemistry Department, was introduced by Dr. D. M. Wiggins, president of the Texas College of Mines, and discussed atomic power. "A bomb might be perfected so powerful in its radioactivity," Dr. Lake stated, "that in the region where it might be dropped human life would be impossible for hundreds of years."

Dr. Lake demonstrated to the visitors with a piece of glass picked up from the Alamogordo, New Mexico, experiment, that radioactivity still lingers after three months. He placed the piece of glass close to an electronic device, which flashed rapidly, indicating the presence of radioactivity.

In the evening guests attended a Sourdough Supper at Liberty Hall, which had for its setting a mining town with a frontier day saloon, roulette wheels, cancan girls and card games.

NEWS BRIEFS

India Mica Reverts to Private Trade. The Foreign Economic Administration has recently announced that the Government purchase of India mica will be terminated on Nov. 30. By an agreement between the Indian Government and the joint United States and United Kingdom mica missions, steps will be taken to facilitate the exportation of India mica through private trade channels.

Spanish Uranium Control. The Minister of Commerce and Industry decreed on Oct. 5 that the State shall have provisional control of all areas which presumably contain uranium-bearing minerals. Fourteen provinces including Madrid are presumed to contain such deposits. It was declared that the decree was essential for the national defense and economy.

South African Uranium Control. By Government proclamation on Oct. 5, the State has been given the right to search or prospect for uranium and thorium in South Africa. It was also provided that all uranium and thorium discoveries must be reported to the Government immediately.

Northwest Mining Men Will Meet in December

The 51st annual meeting of the Northwest Mining Association will be held at the Davenport Hotel in Spokane, Wash., on Dec. 7 and 8.

The publicity committee includes: Frank Lilly, chairman; Leon Starmont, and H. W. Ingalls. Other functions will be covered by a program committee consisting of James L. Leonard, Howard Sherman, Charles A. R. Lambly, P. C. Fedderson, Evan Oscarson, and Bliss Moore; a resolutions committee with J. B. Haffner as chairman, and J. J. Curzon, Donald Callahan, Wray Farmin, Harry Marsh, and Carl Trauerman as members; and a finance committee consisting of C. O. Dunlop, chairman, and Charles P. Robbins, George H. Loop, J. Richard Brown, William Beaudry, and Jerry T. O'Brien as members.

Bolivian Tin Exports Exceed 1944 Monthly Rate

Tin concentrate exports from Bolivia continue at a higher average monthly rate than last year. Exports during September contained 4,625 metric tons of tin, which compares with 3,346 tons in August and 4,750 tons in September last year. Shipments from Bolivia during the Jan.-Sept. period of the current year totaled 32,689 tons, against 28,581 tons in the same period of 1944 and 29,951 tons in the first nine months of 1943.

Consumers still feel that the supply situation in tin will improve within the next six months, in spite of political disturbances in the Dutch East Indies.

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SPEED OF REACTION

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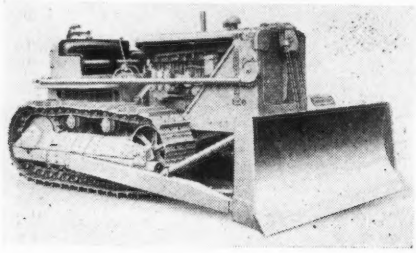
DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

EQUIPMENT NEWS

Cable-Controlled Bulldozers

Caterpillar cable-controlled bulldozers and scrapers, which were announced more than a year ago, are now in production as a result of a lifting of WPB restrictions, it was announced recently by Caterpillar Tractor Co., Peoria, Ill. Delivery of such bulldozers



for D8, D7, and D6 Caterpillar tractors is scheduled for late this year; delivery of scrapers is set for early 1946.

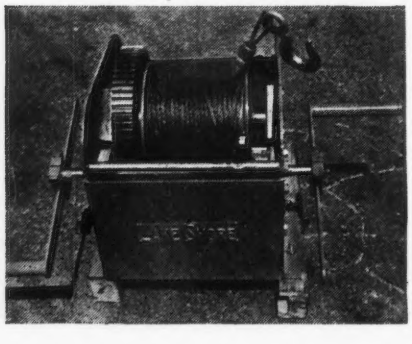
The new products, which will be sold and serviced through Caterpillar dealers, are said to offer certain construction and operating advantages, and to provide the convenience of unit manufacture of tractors and equipment and of one service source. The new cable-controlled bulldozer is shown herewith.

Loading With Electricity

Loading machines equipped with either air or electric motors are now offered by the Eimco Corporation, which announces optional electric drives for Rocker Shovel Models 21 and 40. In anticipating demands by mines that are completely electrified, heavy-duty controls and motors have been developed that will give the same "snappy" service that air-operated shovels give. Electric drives are furnished for either a.c. or d.c. current.

Hand-Operated Winch

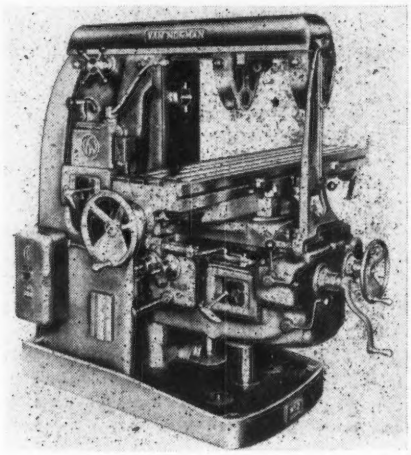
A compact hand-operated winch, suitable for mining operations, approximately 19 in. wide, 19½-in. long, and 16¼-in. high, and capable of handling a 5,000-lb. load at the drum, has been introduced by the Lake Shore Engineering Co., Iron Mountain, Mich. Shipping weight is approximately 230 lb.



The 6-in. diameter drum with 8½-in. face holds two layers of ⅜-in. rope totalling 83 ft. Total reduction of the spur-type, machine-cut, steel, double-reduction gear assembly is 31 to 1. The drum is furnished with a pawl and ratchet and self-locking brake. Self-aligning, dust-proof, grease-packed ball bearings are mounted inside the inclosing steel case. Photograph shows cover removed from winch.

Heavy Milling Machine

Designed for a wide range of production and general purpose milling applications, the new No. 2 heavy Van Norman milling machine is reported to provide faster, easier, and more accurate operation by means of certain new engineering features. One such feature is the heavy large-diameter flywheel mounted on the inside of the column to assure smooth application of power to the cutter. Full details will be furnished by the Van Norman Co., Springfield 7, Mass.



Long Conveyors Installed

At the Missabe Mountain pit of the Charleson Iron Mining Co. at Virginia, Minn., on the Mesabi Range, a conveyor belt having the greatest vertical lift of any in the world has recently been installed. According to the B. F. Goodrich Co., manufacturers, the details of the installation are as follows:

Center to center distance, 947 ft.; total lift, 272 ft.; incline, 35.53 percent grade; belt speed, 578 ft. per min., wet or dry; capacity, 550 tons per hour of iron ore (average size 5 in.; some pieces up to 10 in.); V-flat lagged snub drive with 257-deg. arc of contact on 49-in. head pulley and 36-in. snub pulley; tail pulley, 42 in.; belt, 30-in. eight-ply Goodrich GR-S synthetic rubber cord construction with ¼-in. top, including Transcord breaker and 1/16-in. back cover. This belt replaced a three-belt system on which the transfer and maintenance costs totaled $15,000 annually. It handled nearly 1,500,000 tons of ore during the past season. Maintenance costs have been practically eliminated.

The same manufacturer has furnished a steel-cable conveyor belt for the Gross Marble mine, near Marble, Minn., also on the Mesabi. Its predecessor was supplied to the Morris mine more than a year ago. Both pits are operated by Oliver Iron Mining Co.

At the Gross Marble mine, ore from the bottom of the pit will be lifted 257 ft. at an angle of 13½ deg. The belt at Morris mine lifts the ore 249 ft. at the same angle. This belt, like the other, will complete the ore-lifting task in one continuous operation, obviating the one, two, or three transfers from individual belts that would have been necessary with the old type of conventional cotton-fabric or cotton-cord belt construction.

Although no thicker than a conveyor belt with, for example, six plies of fabric, the new belt's strength is actually the equivalent of 14 such plies.

Parallel steel cable carcasses in conveyor belts, such as these, permit a maximum of troughing in each belt's load-carrying center. This simplifies training of the belt where otherwise it might be next to impossible.

In the new belt there will be about 1,500,000 ft. of steel cables in the belt carcass.

Welding Electrode

A new heavily coated electrode, recommended for high-quality welds on work not easily positioned is offered by Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. This new ACP electrode can be used with ac and dc in all positions, and furnishes a deposit of high tensile strength and ductility, which makes it particularly suitable for heavy plate fabrication and general structural steel work. Full information may be secured from the manufacturer.

For Measuring Pressures

Whole new fields of measurement and control are opened by a pressure sensitive device recently announced by Baldwin Locomotive Works' Southwark Division. The new instrument, called Type SR-4, is used to convert gas or liquid pressure to electrical energy for measuring, recording, or controlling purposes. It is available

MODERN, LOW COST MINE HAULAGE —Now a Must!

Philco "Thirty" Shuttle Car Storage Battery is identified by its distinctive red connectors

There's no time to lose in getting mine haulage costs on a competitive peace-time basis. Modern battery-powered locomotives, trammers and shuttle cars are a *must.* And for power to keep such equipment working at capacity, *at lowest cost,* specify the newest in motive power Storage Batteries, the sensational Philco "Thirty" that gives 30% longer life.

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STORAGE BATTERY DIVISION
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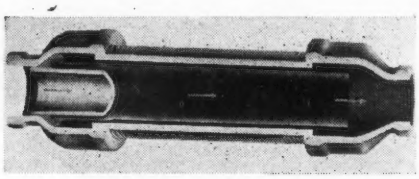
FOR 50 YEARS A LEADER IN MINE STORAGE BATTERY DEVELOPMENT

in several ranges from 0 to 20,000 psi. Heart of the device is a fine wire bonded to a hollow metal core against which is exerted the pressure to be measured. As the pressure increases, this wire stretches, which causes a change in the electrical resistance of the wire. Current flowing in the wire is thus varied, and the changes show up on a dial or actuate control instruments. The wire is sensitive to a stretch of the metal core of only one-millionth of an inch. Because of its nature, this instrument eliminates leakage and clogging troubles.

Versatile Check Valve

Shown herewith is a new check valve which makes use of a length of Neoprene synthetic rubber tubing as its active element, rather than metal poppets or disks. The tubing opens easily under vacuum or pressure in the direction of the arrows, but closes tightly when the flow through it is stopped.

The manufacturers state that valve installations and servicing are simplified with the unit, because no manholes, sleeves, or extractor equipment are required where valves are buried. The tubing is permanently tight, and



foreign matter can not foul the valve or cause leakage. The valve can be used with air, natural gas and hot or cold water—any commercial fluid or chemical that will not attack synthetic rubber.

The valve may be used as a foot valve, a vertical, horizontal, or angle valve in any suction or discharge line. It may also be used as a mixing valve, pump priming valve, or as an air compressor silencer. Immediate deliveries can be made on valves rated at working pressures up to 125 psi. in ½-, ¾-, and 1-in. sizes. The manufacturer is Harman Equipment Co., 937 Santa Fe Ave., Los Angeles, Calif.

INDUSTRIAL NOTES

The Galigher Co., Salt Lake City, Utah, recently opened a branch office at 921 Bergen Ave., Jersey City 6, N. J., to render faster service to eastern and export clients and customers. The company manufactures milling equipment and offers complete laboratory ore dressing facilities, mill design and construction services, and metallurgical consulting services.

LeRoy Keane has been appointed director of sales of the Explosives department of Hercules Powder Co., Wilmington, Del.

Frederic W. Frueh, who was previously with Anaconda Copper Mining Co., New York, as liaison engineer in defense-plant construction, is now with Traylor Engineering & Manufacturing Co. with offices at 3416 Empire State Bldg., New York City.

Chicago Pneumatic Tool Co. announces that **Guy J. Coffey** has been appointed vice president in charge of sales. He was formerly manager of the Los Angeles district office of the company.

Foote Mineral Co., processors of metals, alloys, ores, and chemicals, announces the removal of its entire offices to 12 East Chelten Ave., Philadelphia, 44, Pa.

American Diamond Drill Co. was incorporated in Salt Lake City recently with the objective of establishing in the West a manufacturing center for diamond drills and drilling equipment. President of the new company is **C. L. Christensen**, managing partner of **Christensen Machine Co.**; vice president is **C. L. Lindhe**, manager of **Boyles Brothers Drilling Co.**; secretary-treasurer is **Frank L. Christensen**, manager of **Christensen Diamond Products Co.**, **J. A. Jaques**, formerly with **Lone Star Defense Corporation**, will manage the new company. Offices and plant of **American Diamond Drill Co.** are at 1975 South 2nd. West, Salt Lake City, Utah.

Alvarez-Valls y Cia., Ltda., Calle de Calabria, 114 Barcelona, Spain, announces its availability as importer, installer, and repairer of metallurgical machinery in Spain.

Lee H. Hill has resigned his position as vice president of industrial relations for **Allis-Chalmers Mfg. Co.** to become publisher of *Electrical World*, a McGraw-Hill publication, with headquarters in New York. **William C. Van Cleaf**, formerly Mr. Hill's assistant, has replaced him.

Gar Wood Industries, Inc., Detroit, Mich., has purchased **Buckeye Traction Ditcher Co.**, Findlay, Ohio.

BULLETINS

Motor-Generators. Modern motor-generators maintenance and repair equipment is described in a new catalog of Ideal Commutator Dresser Co., Sycamore, Ill.

Reconversion. Suggestions on taking a "reconversion inventory" of your company's electric motor, V-belt drive, and pumping equipment are contained in three new bulletins of Allis Chalmers Mfg. Co., 180, Milwaukee 1, Wis.

Mine Signals. Mine shaft signal systems using the Sigaphone system are described in a bulletin obtainable from L. D. Stewart, Ironwood, Mich. The unit consists of a small transmitter on the mine cage, a pick-up wire in the shaft, and an amplifier and loudspeaker in the engine house.

Silicone Insulation. A new catalog listing and describing all of the Dow Corning Silicone products available can be obtained from Dow Corning Corporation, P. O. Box 592, Midland, Mich.

Refractory Repair. A new bulletin just issued by Brickseal Refractory Co., 102 Clinton St., Hoboken, N. J., describes a refractory coating applied to brickwork or plastic refractories with a paint brush or spray gun.

Electrodes. Just brought up to date to include recommendations for proper use of newest additions to the Allis-Chalmers line of arc welding electrodes is Bulletin L6348-A, available from Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Gas Welding. A catalog and price list of Airco gas welding and cutting supplies has been published by Air Reduction Co., 60 East 42d St., New York 17, N. Y.

Safety Hook. An improved latch for the company's safety hoisting hook is described in a new bulletin of Thomas Laughlin Co., Portland, Maine.

Motor Endbells. Ball-bearing endbells for use as replacements on all sleeve bearing electric motors and other industrial equipment are described in a new bulletin of Keystone Electric Co., Baltimore, Md.

Cutting Torches. A new publication (Form 52) describes in colorful detail the cutting torches and tips, both hand and machine, available from Victor Equipment Co., 844-54 Folsom St., San Francisco, Calif.

Rotary Kilns. Application of instruments to obtain efficient operation of rotary kilns is fully described in bulletin N-00-6641 just prepared by Leeds & Northrup Co., 4943 Stenton Ave., Philadelphia 44, Pa.

Flow in Channels. Measurement of water flow in open channels by meters of both mechanical and electronic type is described in bulletin 62 released by Bailey Meter Co., Cleveland 10, Ohio.

Earthmoving. Profitable hauling with Tournatrailer from shovel or dragline is described in a new 4-page folder published by R. G. LeTourneau, Inc., Peoria, Ill. Ask for Form TR-106.

Foremen's Handbooks. Seven guidance manuals for supervisors written by Glenn Gardiner are described in a catalog available from Elliott Service Co., Dept. M-97, 219 East 44th St., New York 17, N. Y.

Reagent Feeders. Newest developments in feeding liquid and solid chemical reagents and data relating to such operations are given in bulletn F6-B6, published by Denver Equipment Co., P. O. Box 5268, Denver 17, Colo.

Air Equipment. Worthington Pump & Machinery Corporation, Harrison, N. J., has available new bulletins describing their Blue Brute line of portable air compressors, rock drills, air tools, and accessories.

Molded Rubber. Mechanical molded parts of synthetic rubber are described in a 32-page bulletin available on request on company letterhead to Aero-Seal Rubber Products, 113 North Green St., Chicago 7, Ill. Procedures, results, and the special methods required for molding synthetic rubber are described.

Controlling pH. A completely revised edition of the Taylor handbook and catalog, "Modern pH and Chlorine Control," is now available from W. A. Taylor & Co., 7300 York Road, Baltimore 4, Md.

Wire Cloth. A 56-page catalog containing data on industrial wire cloth has been published by Buffalo Wire Works Co., Inc., 449 Terrace, Buffalo 2, N. Y.

Diesel-Electric Sets. Caterpillar Tractor Co., Peoria, Ill., has prepared a booklet describing various installations of diesel-electric power supply installations.

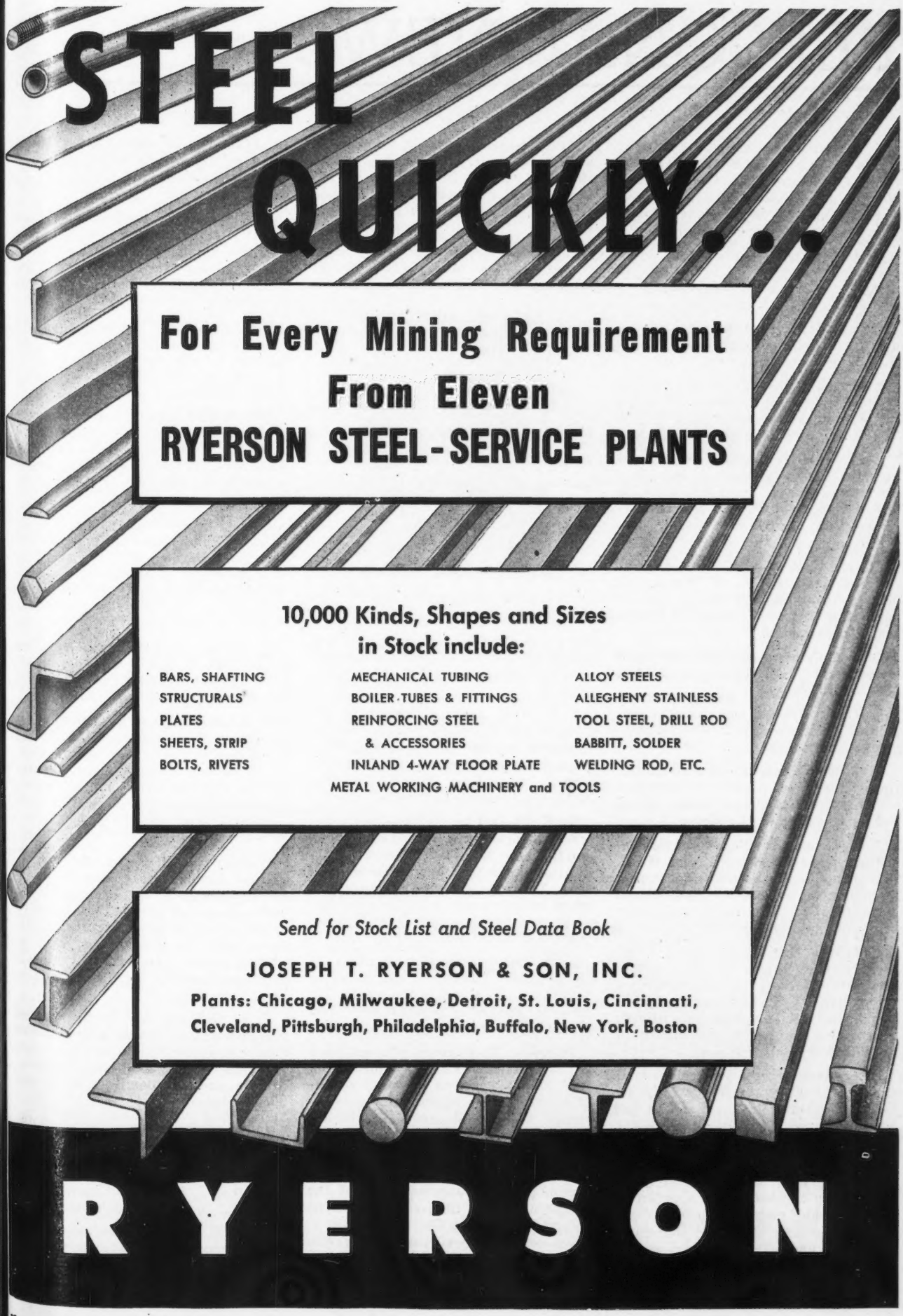
Mining Machinery. Lake Shore Engineering Co., Iron Mountain, Mich., has available its catalog No. 452 describing the company's line of industrial machinery and castings, including several items of mining machinery.

Centrifugal Pumps. Engineering applications of centrifugal pumps form the subject of a book designed to help solve all ordinary pumping problems. It is free to pump users, but is priced at $2.00 to others, and is published by Economy Pumps, Inc., Hamilton, Ohio.

Spectrographs. Applied Research Laboratories, 4336 San Fernando Road, Glendale 4, Calif., and the Harry W. Dietert Co., 9330 Roselawn, Detroit 4, Mich., now have ready for mailing a 4-page folder describing a new 2-meter grating spectograph.

High-Current Contacts. Callinite is a high conductivity facing material for arcing tips on circuit breakers, motor controllers, and similar electrical equipment. The various types of Callinite alloys are described in Bulletin 158, available from Callite Tungsten Corporation, 540 39th St., Union City, N. J.

Color Dynamics for Homes. Use of color to make homes better looking and more useful is particularly well illustrated in a 24-page, four-color booklet, "Color Dynamics for the Home," now available from Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.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PERSONAL NEWS

R. J. Hendricks, manager of Gray Eagle Copper Co,, in Siskiyou County, Calif., and Newmont gold properties in Nevada and Yuba counties, has gone to the Island of Cyprus as manager of Cyprus Mines Corporation.

Louis A. Wright, consulting mining engineer, has returned to San Francisco, Calif., after a protracted professional stay in South America.

Forbes B. Cronk was recently appointed general mining engineer for the Oliver Iron Mining Co.

Myron B. Sisson has been made superintendent of Sunrise iron mine, in Wyoming, a property of the Colorado Fuel & Iron Co.

Alan M. Bateman on Oct. 8 announced his resignation as assistant director of the Foreign Procurement and Development Branch of FEA, effective Nov. 1. He will resume consultation practice.

Clifford R. Wilfley, of Denver, Colo., resigned from the U. S. Bureau of Mines on completion of his war service appointments and has resumed former consulting practice.

Keith A. Cameron has been appointed manager of North Broken Hill Ltd., New South Wales.

A. T. M. Mehliss was recently appointed field geologist to the Government of Swaziland.

Fred W. Thompson, of Haileybury, Ontario, was recently elected president of Thompson-Lundmark Gold Mines, Ltd., succeeding **G. R. Burge.**

A. F. Newman has been appointed assistant general manager, and **W. G. Brissenden** has been made mine superintendent, for Paymaster Consolidated Mines, Ltd., at the company's property at South Porcupine, Ont.

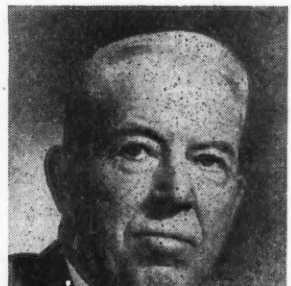
Clifford S. Gibson, ventilation engineer for the Ontario Mining Association, left by air in early October for Lima, Peru, where he will be engaged during the next two months outlining a program of silicosis prevention for the Soc. Nacional de Minería.

Pete Mosier recently resigned as superintendent of the Bennett Mining Co., in Neihart, Mont., where he had been in charge of the mine and 50-ton selective flotation mill for the past year.

Solomon Lieb has resigned after eight years' service as mill superintendent and chief metallurgist with Compania American Smelting Boliviana, Ltda., and has taken a position as mill superintendent with Cia. Min. y Agricola Oploca de Bolivia, a Patiño subsidiary.

W. Kingston, chief inspector of mines in Victoria, Australia, has retired after 19 years' service. Prior to joining the Department of Mines he was director of the Bairnsdale School of Mines for 12 years.

F. S. Norcross, Jr., has been elected a vice president of Freeport Sulphur Co. He is president and general manager of Freeport's manganese mining subsidiary in Cuba and will participate, also, in the company's expansion activities.



F. S. NORCROSS, JR.

J. G. Hart, research officer to the Council for Scientific and Industrial Research at the University of Melbourne, has been appointed chief metallurgist with King Island Scheelite N. L., King Island, Tasmania.

R. E. Phelan has established a research laboratory at Carson City, Nev., and has been doing a general metallurgical research and examination business. The immediate examination on which he is engaged is at the old Alexander and Brooklyn mines, at Grantsville, near Ione, Nev.

A. A. McLeod, general manager of Triton Gold Mines N. L., Western Australia, has accepted the position of general manager of Dittmer Gold Mines Ltd., northern Queensland.

James A. MacKillican, who has been with the Meriden (Minn.) Iron Mining Co. for 33 years, as manager of the interests of that organization, has resigned. **Clarence W. Aronson**, who has been with the same company for 30 years, succeeds him.

William F. Pellens, of Virginia, Minn., general superintendent of the Virginia-Eveleth district mines of the Oliver Iron Mining Co., retired Oct. 1, after completing 41 years of service with the company. **William J. Kaiser** succeeds him as general superintendent.

Enoch Perkins, of the Mutual Chemical Company of America, is visiting Turkey. He expects to return to the United States around the end of the year.

Fred Searles, vice president of Newmont Mining Corporation, has been awarded by the A.I.M.E. the William Lawrence Saunders gold medal for 1946. Mr. Searles is a mining geologist and consulting engineer.

H. A. McKinstry has been appointed professor of geology at Harvard. Until recently he was chief of the Minerals Division of the Foreign Economics Administration.

J. R. Sendon, recently superintendent of Peru Molibdeno, has established a consultation office at 82 Beaver St., New York City. He will specialize in mining problems, promotions, and surveys in South America.

John Hope recently resigned his position as chief engineer for the South American Development Co. at Portovelo, Ecuador, to assume the position of chief geologist for Consolidated Coppermines Corporation, at Kimberly, Nev.

Dr. Walter Searight, formerly of the South Dakota Geological Survey, has recently been appointed to the staff of the Missouri Geological Survey.

E. M. Lindenau has resigned as senior mining engineer with the U. S. Bureau of Mines in Salt Lake City, Utah, where he was doing exploration work for strategic minerals and mining research in connection therewith. He is establishing an office in Tucson, Ariz., as a consultant.

William Russell Bacon has been appointed geologist in charge of operations at Hugh Malartic Mines, in the Malartic area of Quebec. Mr. Bacon recently returned from Peru, where for three years he was in charge of exploitation and examination of mines in southern Peru for Cerro de Pasco Copper Corporation.

S. E. Hollister has been appointed manager of Southwestern Engineering Company of the Philippine Islands with headquarters at 203 Ayala Building, Manila, and will soon leave for his new assignment.

John C. Russell has joined the metallurgical staff of the American Cyanamid Co. at Stamford, Conn., after completing three years of wartime service with the U. S. Tariff Commission as specialist on non-ferrous metals.

Dr. F. M. Van Tuyl, professor of geological engineering at the Colorado School of Mines, has left for Sao Paulo, Brazil, where he has been retained by a group of Brazilian capitalists in an

advisory capacity for planning a long-term exploratory program for Brazil. He will be on leave of absence from the School of Mines for about two months, and then will continue to direct the Brazilian program from Golden. He will return to Brazil at intervals to supervise the mineral explorations.

Dr. Melville F. Coolbaugh, president of the Colorado School of Mines, at Golden, has announced his resignation to take effect Jan. 1, 1946, or as soon thereafter as possible. This is on advice from his physicians. The school expanded greatly, acquiring many new buildings and facilities under the leadership of Dr. Coolbaugh, who took office as head of the School of Mines on Sept. 1, 1925. He is also secretary of the Colorado Geological Survey, a member of the State Planning Commission of the Mineral Resources Board, and was a regional director of engineering war training from 1940 to 1945.

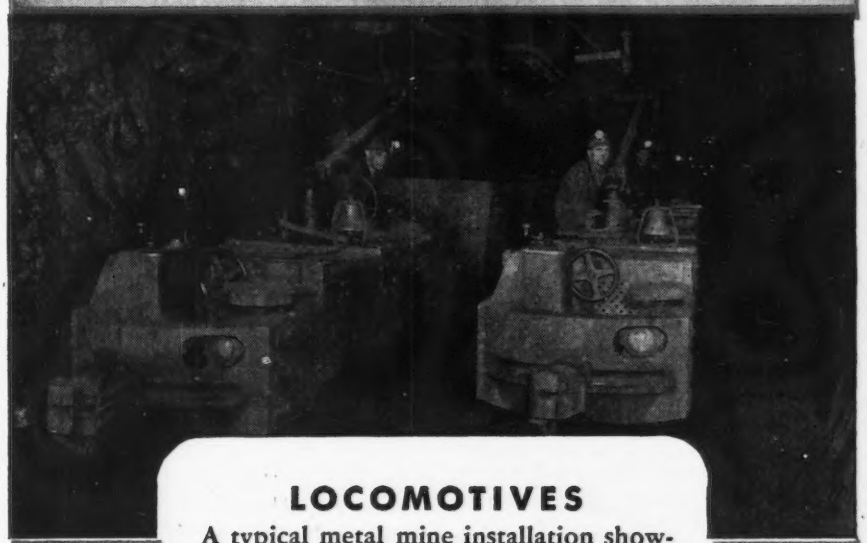
P. Malozemoff has left Washington, where he served as engineer-analyst in effectuating the Premium Price Plan administered jointly by OPA, WPB, and MRC, and has entered the employ of Newmont Mining Co. His headquarters are at 14 Wall St., New York, N. Y.

Dr. C. K. Leith ended more than five years' war service in Washington with the passing of WPB on Nov. 3. He was the first man in the mineral field to be called to Washington in June 1940 by E. R. Stettinius, Jr., to help in the establishment of the Advisory Commission to the Council of National Defense, and he and Vice Chairman William Batt were the only survivors of the original commission to remain to the end of WPB.

Prof. J. Murray Riddell, recently appointed head of the department of mining engineering at Michigan College of Mining and Technology at Houghton, Mich., is planning changes in his department that are expected to give the students a broader training, with theory and practice well balanced. To this end the staff is to be increased. Corollaries of the main plans will be the use of a greater number of special lecturers from industry, somewhat greater stress than previously on coal mining, and an increase in the number of student field trips, many of them taken to distant points. Trips to Canada and the Far West, interrupted by the war, will be not only resumed but extended.

Entering Lewis Institute (now part of Illinois Institute of Technology) when not quite 16 years old, Mr. Riddell received much of his training there and then attended Michigan College of Mines for two years, graduating in 1911 as bachelor of science and engineer of mines. After teaching a short time at MCM he was engaged in construction work and then mining engineering, on the staffs successively of four Michigan companies. In 1919 he joined the Corrigan, McKinney Steel

Jeffrey EQUIPMENT Meets Metal Mine Needs

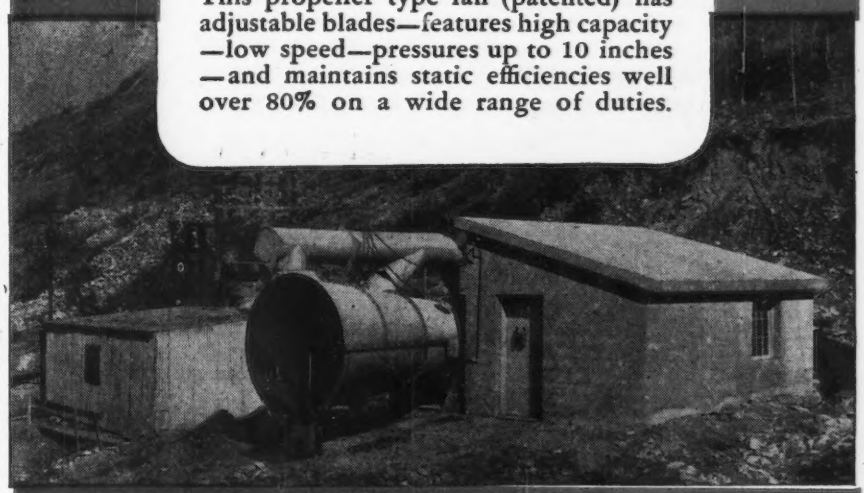


LOCOMOTIVES

A typical metal mine installation showing Jeffrey Locomotives handling iron ore. These locomotives have the stamina to stand up under rough usage, and are designed to protect the equipment from water dripping from the roof and wet muck over the track.

AERODYNE FANS

A Jeffrey Aerodyne fan installation at a zinc mine in Colorado. Adequate air supply at the working face is very essential to maintain top production. This propeller type fan (patented) has adjustable blades—features high capacity—low speed—pressures up to 10 inches—and maintains static efficiencies well over 80% on a wide range of duties.



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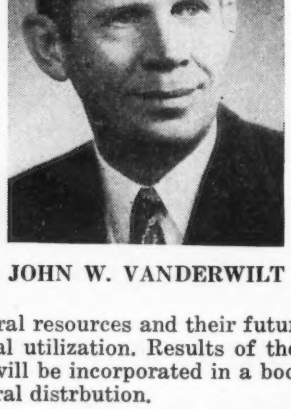
Co., subsequently rising from mining engineer to assistant district superintendent of the Menominee Range Mines, superintendent of Kentucky Coal Mines, and in 1926 to general superintendent of the last-mentioned properties. In December 1928 he became consulting engineer for Crowell & Murray, Inc., of Cleveland. From January 1930 to March 1932 he was chief engineer of the Krivoi Rog District, Russia, for Oglebay, Norton & Co.

Rejoining Corrigan, McKinney, Professor Riddell was made manager of mines. On consolidation of that firm with Republic Steel Corporation, he was appointed assistant manager of that company's northern ore mines. In June 1939 he became a consulting mining engineer, with headquarters in Duluth. The next year E. J. Longyear company named him manager of its mining division, from which post he has come to Michigan College of Mining and Technology. Professor Riddell has also engaged in individual research on iron ore problems, both mining and metallurgical, in Canada.

A member of the Lake Superior Mining Institute and the A.I.M.E., he serves on the mining methods committee of the latter and was chairman of it in 1940. He was chairman also of the Minnesota Section of the Institute in 1940.

James L. Vallely, who has been connected with the U. S. Bureau of Mines Bauxite Exploration Project as a mining engineer for the last three years, is now employed by the Gilbert & Hageman Co., of Winchester, Ky. The company operates a group of fluorspar mines in the central Kentucky fluorspar district.

John W. Vanderwilt, Denver consulting geologist, has been appointed by the Colorado State Mineral Resources Board to direct a study of Colorado's



JOHN W. VANDERWILT

mineral resources and their future potential utilization. Results of the survey will be incorporated in a book for general distrbution.

William G. Kane, chief of the metals and minerals section of the FEA in Mexico for the past three years, has resigned, and the termination of the contractual relations of this office will be administered by **W. J. Shedwick.** Mr. Kane's new offices for consulting work will be at Room 504, Seguros de Mexico Bldg., No. 9 San Juan de Letran, Mexico, D.F.

Prof. Ernest J. Townsend has been appointed head of the engineering administration department of Michigan College of Mining and Technology, at Houghton. Last year he was consultant for the college on postwar plans to various governmental units in northern Michigan. Concurrently he was a field representative of the State Planning Commission and is now executive secretary of the Houghton-Keweenaw branch of the Committee for Economic Development. Courses added this year in his department include: Principles of Industrial Organization and Management; Personnel Relations; Industrial Psychology; Industrial Aspects of Sociology; and Elements of Economic Statistical Methods. Professor Townsend graduated from the College at Houghton in 1931 with a degree in mining engineering. He also has the degree of Master of Science.

Dr. Francis C. Frary, director of research of Aluminum Company of America, has been awarded the Perkin Medal in recognition of his outstanding accomplishments in industrial research. Presentation will take place at a dinner meeting of the society at the Hotel Commodore in New York on Jan. 11, 1946. Dr. Frary is the fortieth member of a group of scientists to receive the Perkin Medal. He is also the second scientist on the staff of Aluminum Company of America to be so honored. In 1911, **Charles Martin Hall** was awarded this medal for his development of the present-day process for the manufacture of aluminum. Dr. Frary was born in Minneapolis in 1884. He was graduated from the University of Minnesota in 1905 with a B.S. degree in analytical chemistry and received his master of science degree the following year. He joined Oldbury Electrochemical Co. in 1915 as research chemist. Here he developed the technique of producing phosgene. At the close of the war Dr. Frary was a major in the Chemical Warfare Service. Of the many achievements with which he has been associated during his long aluminum career, some of the outstanding include production for the first time of pure aluminum (99.98) by electrolytic refining, the production of pure alumina by electro-thermal processes, and other metallurgical processes of importance. Dr. Frary is a member and past president of the American Institute of Chemical Engineers and the Electrochemical Society. He is also a member of the American Chemical Society, the A.I.M.E., the Institute of Metals, and the Chemists' Club.

Reid B. Gray has been appointed director of the Reynolds Research Institute, research subsidiary of Reynolds Metals Co.

Charles V. Harris has resigned as research metallurgist with International Minerals & Chemical Corporation and accepted the position of mill superintendent with Cia. Minera La India, Managua, Nicaragua.

CHARLES V. HARRIS

Michael Schwarz, former director of the Copper Division of the War Production Board, has joined the executive staff of the Bridgeport Brass Co., to serve in the capacity of market adviser.

Leslie G. R. Crouch, formerly Inspector of Mines for the Mines Branch, Manitoba Department of Mines and Natural Resources, has been appointed professor of mining engineering at the University of British Columbia, Vancouver, B. C.

OBITUARIES

John Hickey, long a resident of Philipsburg, Mont., and president of Moonlight Mining Co., died on Sept. 30, aged 69.

J. P. Norrie, consulting mining engineer and associated with many Quebec mining enterprises, died at Noranda on Oct. 8, aged 54.

R. V. Le Sueur, who was extensively interested in mining interests in Canada and vice president of Kirkland Lake Gold Mines, died recently in Toronto.

Kenneth Clinton (Jack) Howard, former superintendent of the Mission Mining & Royalty Co., died Oct. 13 at Hot Spring, N. M. He was 46 years old.

Blaine Otis, mining engineer, died in North Hollywood, Calif., on Sept. 24, at the age of 52.

Edwin James "Ted" Chenoweth, general superintendent of Bralorne Mines, Ltd., died in Vancouver, B. C., on Sept. 28.

Thomas P. Householder, 56, mining engineer and civic leader, died Oct. 8 at his home at Eureka, Utah.

Norman N. Blye, 62, formerly superintendent of the Silver King Consoli-

dated mine, now part of Silver King Coalition Mines Co., died at Park City, Utah Oct. 10.

William Smith Livingston, mining engineer, an alumnus of Columbia University School of Mines, and consultant to James W. Gerard, died at Scarsdale, N. Y., on Oct. 29. He was 57.

Glen P. Ives, for many years active in gold mining in the Province of Coquimbo, Chile, died on Aug. 29 last at Ovalle, in that country. Mr. Ives was a member of the Class of 1908 of the South Dakota School of Mines.

Dorsey A. Lyon, metallurgical engineer, at one time chief metallurgist of the U. S. Bureau of Mines and for years supervising engineer of the Bureau's experimental station in Salt Lake City, Utah, died in Palo Alto, Calif., on Oct. 16, aged 74.

Dr. Henry Barnard Kummel, former State Geologist of New Jersey and first president of the American Association of State Geologists, died at Trenton, N. J., on Oct. 23, at the age of 78.

Henry Ross Taylor, assistant mill superintendent for Chino Mines Division of the Kennecott Copper Corporation at Hurley, N. M., died at his home in that city June 3. He was born in Barron, Wis., in 1888, and received his mining engineering training at Lawrence University, Appleton, Wisconsin. He had been engaged in mining operations in Canada, and in California, Utah, and other western states, before going to Hurley eight years ago.

Oscar Butler Perry [1876-1945]

Colonel O. B. Perry began his mining activities in the gold-dredging industry in the Oroville district of California. He continued in alluvial mining, both gold and tin, for most of his professional life. He was one of the dredging fraternity.

As an interlude he played an important role in the engineering activities of the first World War. After training at Camp Humphreys, and with a captain's commission, he organized, equipped, and trained the mining regiment, the 27th Engineers, and took the first battalion overseas in 1918. He was successively major, lieutenant colonel, and colonel. Various units of the regiment saw service in all the major offensives. Its engineering activities included the construction of dugouts, roads, bridges, and light railroads. In the Meuse-Argonne offensive a total of 55 bridges were built or rebuilt. At the conclusion of the war he returned with the 27th Engineers to the United States in April 1919.

Perry was born in Bloomington, Ind.; graduated from Indiana University in 1897 and from Columbia University in 1900 with the degree of mining engineer. He was manager of the Indiana Gold Dredging Co. in California and supervised the design of its first dredge, which embodied many new features and which established the beginning of what was subsequently known as the California type gold dredge. He then became chief engineer and manager of the Western Engineering & Construction Co., which built the first two deep-digging dredges on the Yuba River and subsequently constructed some 30 dredges in the United States, British Columbia, and Alaska.

In 1904-05 Perry made a number of placer examinations for the Guggenheim Exploration Co. in British Columbia and Yukon Territory, under the direction of John Hays Hammond, then general manager and consulting engineer for the company. In 1906 he became assistant to Mr. Hammond. He became general manager of the Yukon Gold Co. and had charge of properties in California, Nevada, British Columbia, Yukon Territory, and Alaska. Both hydraulic and dredging properties were equipped and operated.

After the end of the first World War Perry returned to the management of the Yukon Gold Co., directing his attention principally to its tin operations in Malay. Four properties were selected and equipped with large American-type dredges. Jigs of the Harz-Cooley type were designed into the washing equipment and proved very successful.

Perry resigned the management of the Yukon company in 1929 after some 20 years of service in many countries. He next became interested in gold dredging in Oregon and a tin mine in Bolivia. He invented the Perry idler, a mechanical device to be applied to deep-digging dredges. By means of this device dredging depths were greatly increased. It is the most successful of several devices invented to facilitate deep dredging and was applied to the deep-digging Yuba dredges.

He was recognized as a brilliant engineer, a hard worker, and a successful manager. In expanding the dredging industry and increasing its efficiency he occupied a leading place among the engineers who specialized in this branch of mining. He died July 24, 1945. Surviving are his widow and two daughters. He joined the American Institute of Mining and Metallurgical Engineers in 1901 and was also a member of the Mining and Metallurgical Society of America.

COREY C. BRAYTON

LETTERS

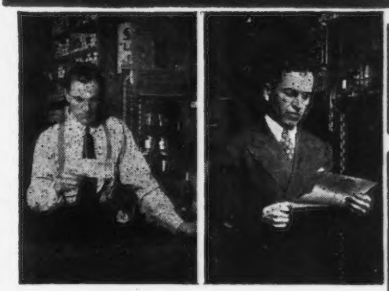
Suggestions to Stimulate Postwar Gold Production

The Editor:

The position of the lode gold mining industry of America as a result of the war, and the arbitrary treatment of the industry under Order L-208, are sufficiently well known to require no further exposition at this time. The

(Continued on page 158)

LUBRICATION SERVICE FOR MACHINERY USERS



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NEW BOOKS

CANADIAN MINES HANDBOOK 1945. Northern Miner Press Limited, 122 Richmond Street West, Toronto, Can. Pp. 320. Price $1.

This valuable annual lists 7,100 mining companies and syndicates organized in Canada. Part I gives the details on 1,300 active corporations, including 559 formed in 1944. Part II deals with 5,800 others, most of which are inactive. The position of the operating companies is reviewed in detail with five-year comparisons of output, earnings and other essential information. Particulars are given of the active non-producing companies, such as office addresses, transfer agents, directors, capitalization, property holdings, and current activities. For the investor a long-range table of quotations on the Toronto Exchange up to June 30 last is provided, with schedules of brokers' commission rates, government transfer taxes, and related data.

In all, 559 new mining companies were organized in 1944. These companies, because of wartime regulations, have been limited in activity to exploration work. With the removal of restrictions they may broaden their programs to the extent that their exploration results justify. The Province of Quebec leads the Dominion in new mining work.

MINERALS OF MIGHT. By W. O. Hotchkiss. The Jacques Cattell Press, Lancaster, Pa. Pp. 206. Price $2.50.

This small volume represents a laudable effort to inform the lay reader on the subject of natural resources in their relation to world power. The mining man, already more or less familiar with the basic data presented, will hardly be much interested. The dialogue style employed is moreover somewhat tiresome, whoever be the reader, and the provision of the deck of a Great Lakes ore carrier as a stage for the author's lectures is a trifle stilted. Nevertheless, the layman who wants some information on this particular topic will find a lot between the covers.

In his closing two chapters Dr. Hotchkiss airs his views as to the "peace future" of mineral resources and the possibilities of World War III. He boasts no prophetic ability. New unknown and unpredictable developments in science and technology may effect important changes. New discoveries may completely change our way of living and our uses for minerals. Most of these changes, however, will be evolutionary and not revolutionary, he thinks. Here fate played him a mean trick, for in this book, which came out during the past summer, he says, "Other sources of power, such as atomic energy, may be written off at present as not much more than vain imaginings, not impossible perhaps but exceedingly improbable."

As to iron, Dr. Hotchkiss holds that the greater part of our future ore will be supplied by concentrators in the Lake Superior district and that some of the high-grade ore will come from overseas. The world will use more steel than in the past, and, therefore, in punishing the aggressors, we should not deprive it of their steel production. This statement is made on the assumption that minerals are to be allowed to flow wherever need demands, as to which the author seems to have some doubt. Business men rather than nations, he thinks, should handle the trade in minerals, so that they can be blamed for any claimed unfairness, thereby minimizing jealousies and hatreds between the nations.

Another war is more than a possibility, Dr. Hotchkiss thinks, but eventually we will develop the machinery for preserving world peace. Force must be available, and here mineral resources enter the picture. Dr. Hotchkiss advocates the accumulation of stockpiles, particularly of iron ore, all ores that are in the government's possession at the war's end to be thus stored, as well as the iron and steel scrap. We wonder what he would have advocated had the atomic bomb made its debut a few months earlier?

PUBLICATIONS RECEIVED

"Aluminum Applications by Industries." Aluminum Company of America, Pittsburgh, Pa. Applications are listed for each of 23 industries, comprising 70 pages. In addition there are 7 pages of general applications. A total of 3500 applications is listed.

"Should Price Control be Retained?" By H. G. Moulton and K. T. Schlotterbeck. Brookings Institution, Washington 6, D. C. Pp. 43. Price 50¢.

"Fifty Common Rocks and Minerals of West Virginia." By James H. C. Martens. Bull. 9, West Virginia Geological Survey, Morgantown, W. Va. Pp. 42.

"Geology and Manganese Deposits of the Glade Mountain District, Virginia." Bull. 61, Virginia Geological Survey, University, Va. Pp. 150 plus maps.

"Economic Mineral Resources and Production of California." A Survey with Reference to Postwar Employment. Samuel H. Dolbear, Bull. No. 130, State Division of Mines, San Francisco. A report made pursuant to a contract between the State Reconstruction and Reemployment Commission and the Division of Mines of the Department of Natural Resources. Price $2 postpaid, plus 5c. sales tax for residents of California.

"California Mineral Production and Directory of Mineral Producers for 1943." Bull. No. 128, State Division of Mines, San Francisco. Pp. 222.

"Tungsten Deposits of Mineral Range, Beaver County, Utah." Bulletin 25. Utah Engineering Experiment Station, Salt Lake City, Utah. Pp. 48 Price 50c.

"Geology of Ropes Gold Mine, Marquette County, Michigan." Bulletin of Michigan College of Mining and Technology. Pp 115-128.

"Research in Action." A 57-pp. illustrated brochure which presents an over-all description of the activities of the Battelle Memorial Institute, Columbus, Ohio, which completed its 15th year on July 1. The staff, originally 30, now numbers 600.

"Geology of Groom District, Lincoln County, Nev." Bulletin No. 42 (Geology and Mining Series). University of Nevada, Reno. (Lead, silver, zinc, and gold occur in this district.) Pp. 53 and maps. Price 25c.

"Industrial Minerals as a Field for Prospecting in Alaska." Department of Mines, Territory of Alaska, Juneau. Pp. 80.

"Glossary of Forging Terms." Kropp Forge Co., Chicago. Pp. 19.

"Manganese and Iron Deposits of Morro do Urucum, Mato Grosso, Brazil." Bull. 946-A, U. S. Geological Survey, Washington, D. C. Pp. 47 plus maps. Price 75¢.

"Geology of East Bull Lake Area." Ontario Department of Mines, Toronto. Pp. 19 plus map.

"War Plants Disposal: Iron and Steel Plants." Second progress report on preparation of joint hearings to be held by the War Contracts Subcommittee of the Committee on Military Affairs. Pp. 21 plus charts.

Bureau of Mines, Washington, D. C. has issued the following Information Circulars and Reports of Investigation. No charge is made.

"Fluorescence Test for Uranium." I.C. 7337. Pp. 6.

"Processes for Making Barium and Its Alloys." I.C. 7327. Pp. 16, plus illustrations.

"Destruction of Damaged, Deteriorated, or Unwanted Commercial Explosives." I.C. 7335. Pp. 6.

"Size of Smallest Dust Particles Revealed by Various Microscopic Systems." R.I. 3821. Pp. 11.

"Construction and Operation of the Dearborn Magnesium Pilot Plant." R.I. 3823. Pp. 26.

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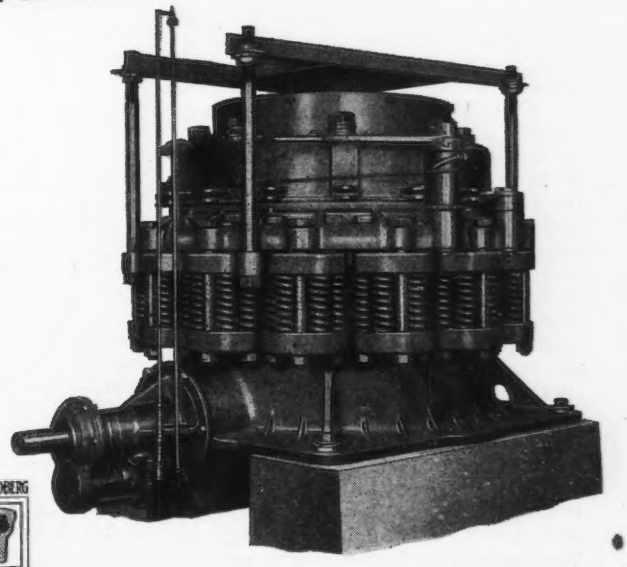

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REGIONAL NEWS

COLORADO

Lawsuit seeks to restrain work on Clear Creek road—Stiers Bros. removes Leadville tunnel equipment

★Plans for still further clarifying the waters of Clear Creek, to end complaints from Golden and from irrigation farmers who claimed that tailings are still affecting domestic and irrigation water supplies, were discussed recently at a joint meeting of the Idaho Springs Chamber of Commerce and the Clear Creek County Metal Mining Ass'n. The delegation from Golden suggested that rough ore-dressing might be accomplished dry, without the use of water, and that tailings from the final processing could be piled on waste land. Both delegations joined in demanding early completion of the "water-level" route, Highway 6, up Clear Creek Canyon, jointly by the U. S. and State governments, which would render Idaho Springs and Central City more reachable by truck for heavy cargoes, and promote the building of new ore-handling facilities.

However, this route has been made the subject of a lawsuit of interest to miners. It was planned to use the abandoned roadbed of the Colorado and Southern narrow-gage right-of-way, remembered by old-timers who used to rock, roll, and pitch in the narrow-gage coaches and sleeping cars, to and from Georgetown and Idaho Springs and Central City. Arthur D. Quaintance, Denver attorney, has filed suit to restrain use of this roadbed, claiming that it reverted to the original owners when abandoned by the railroad, and that through the ownership of more than 2,000 acres of land in the canyon all the way from Golden to the forks of Clear Creek, the Quaintance family has prior rights. He further claims that there are $3,000,000 in gold values still in the sands of the creek, which earlier operators were unable to recover because of inaccessibility. The suit sets out that the Quaintance family proposed to run power pipeline along the right-of-way and use the resulting water and power to treat the gravels by modern methods. The suit, filed in Golden, seeks to restrain the State, County and Federal governments from doing any work on the highway until the issue is settled. The action is filed by members of the family as executors of the estate of a brother, Charles F. Quaintance, who died in 1940.

State officials say that plans for the highway will not be abandoned, although compensation will be paid to the Quaintance family if it can prove damage from the highway plan.

★Idarado Mining Co., operator of the Treasury Tunnel group of mines, has announced plans for an additional 500-ton milling unit, which is expected to be in operation early in 1946. The present 300-ton mill is unable to handle all the ore mined. The operation is now employing about 125 men and hiring more as rapidly as they can be found. The company has bought a considerable number of claims in addition to those made accessible by the Treasury Tunnel, and promises to be a major mining operation in Colorado. The raise to the old Black Bear workings above the tunnel level is scheduled for completion next spring.

★Fred Ward and Bill Radar, operating a lease on the Mollie Kathleen property, in Cripple Creek, got more than $1 a pound for ore which they took from a small but rich pocket recently. It brought $1,717 for 1,545 lb.

★The Lark lease near Silverton, which has been driving a lower tunnel, has hit the chimney of ore toward which the owner, V. H. Steele, has driven for the past two years, but so far the ore has not come up to expectations. Steele is managing the property for United Coal Corporation, which has it under lease.

★Purple Top Tunnel & Drainage Co., owned by Baillie Brothers and Turnipseed Brothers, of Glenwood Springs, is shipping lead-silver ore to Leadville from the eastern slope of the Mosquitoes.

★Large export orders are being developed by the Denver mining equipment companies, in addition to a backlog of domestic orders piled up on low priorities, or none, during the war. One company is completing an order for eight large ball mills for Russia, and 420 flotation cells which are among the largest ever built. This company also has orders for ball mills for lead ores in Morocco, from the French Government; and for grinding equipment for use in treatment of sand in glass manufacture in Mexico and Peru. Another has a contract from the Soviet Government for machinery to "squeeze" gasoline from natural gas.

★Equipment of Stiers Brothers Mining Co., the contractors, has been moved from the Leadville deep-drainage tunnel, stopped short of completion by failure of Congress to appropriate the necessary money. The tunnel has been placed on a standby basis, but is being maintained. Leadville mining operators are still hopeful of obtaining a deficiency appropriation to complete the tunnel at least to the Hayden shaft. If funds are not obtained in the deficiency measure, they will be requested in the next regular Department of Interior appropriation.

★The Bureau of Mines office for mineral investigations, established in Denver under direction of William P. Huleatt for the finding of minerals necessary to the war effort, is expected to be closed and the work concentrated under the Salt Lake City office, as a result of Congress' cutting funds available for the work. The Wyoming office is also expected to be closed.

★The School of Mines was forced by demand to give its intensive English course for foreign students this fall, although originally this was designed as a summer course. There are ten students, four on Turkish Government scholarships, two on scholarships from Yunan Province, in China, and four from Venezuela.

★Mines' enrollment is double last year's, and the school is installing 35 trailers to accommodate married veterans, until its unit of 48 apartments, already under way, is completed. Virtually half the student body consists of returning veterans.

★The Cresson shops, at Cripple Creek, are completing a most unusual job. This is the turning of a new shaft for the cable drum at the Vindicator mine, to replace one broken in May, 1944, when a temporary repair was made. The new shaft is being turned from a billet 19 ft. long and 13 in. in diameter. It must taper exactly from 11 to 12⅛ inches. The shops are busy turning out other equipment for the resumption of gold mining, including a new steel cage for the Portland's No. 1 shaft.

ARIZONA

State zinc production increased—Forest Service protests patenting mining claims

★Charles H. Dunning, director of the Arizona Department of Mineral Resources, has reported to Governor Osborn that zinc production in Arizona has increased from 6,711 tons a year to about 29,000 tons. The San Xavier mine of Eagle-Picher Mining & Smelting Co., at Sahuarita, and the Copper Queen mines of Phelps Dodge Corporation, at Bisbee, which have recently entered the zinc field, caused the increased production. Mr. Dunning reported that at present there is no zinc smelter in the State and stated that it is a fertile field for private capital to build such an enterprise to take care

of the increased zinc production in that area.

★The U. S. Forest Service has filed a protest with the United States Land Office in Phoenix against the patenting of mining claims in the Catalina Mountains in Pima County by Randolph Jenks, according to an announcement by E. F. French, attorney for the U. S. Department of Agriculture with headquarters in Albuquerque, N. M. Mr. Jenks made application on July 18, 1945, for mineral patents on about 120 acres of land in the recreational area of the Catalina Mountains west of Summerhaven. It is the contention of Government representatives that the land is non-mineral in character and is more valuable for national forest purposes.

★J. Bryant Kasey, chairman of the Yavapai Small Mine Operators, has requested Arizona Congressmen and Senators to try to effect immediate release of miners now in the armed services to relieve the acute shortage of miners now existing in mines in Arizona. Favorable replies have been received from the lawmakers in Washington.

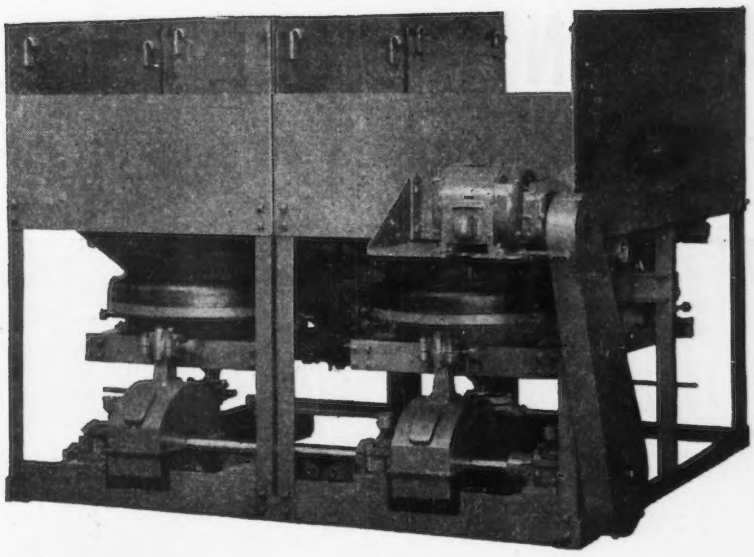
★Inspiration Consolidated Copper Co., of Miami, paid its 1945 taxes under protest, as the company claims the assessment of $14,550,000 set by the State Tax Commission was too high. The amount paid was $246,912.74.

★Numerous small gold mines in Tombstone and Wickenburg are planning to reopen as soon as they can secure mining machinery and equipment. Some of these mines are old producers that operated prior to the war; others are newcomers in the field.

NEVADA

A.S.&R. terminates Copper Canyon lease — Placer and openpit gold operations resume

★International Smelting & Refining Co., Anaconda subsidiary, will terminate on Nov. 30 its lease on property of the Copper Canyon Mining Co. in Lander County, operated since early 1941. A 400-ton flotation mill was completed by International in February 1942, and the new three-compartment Julie shaft, equipped with 104-ft. steel headframe, was sunk 500 ft. Under the lease agreement, involving the Copper Canyon and Copper Basin groups of mines, International undertook expenditures in excess of $500,000 and had an option to purchase 2,000,000 shares of Copper Canyon Co. stock, this option terminating with relinquishment of the lease. Copper production in 1943, the peak year, was nearly 2,000,000 lb. and concentrate, shipped to International's Tooele smelter, in Utah, has had a gold content considerably exceeding in value that of copper. During the past two years manpower



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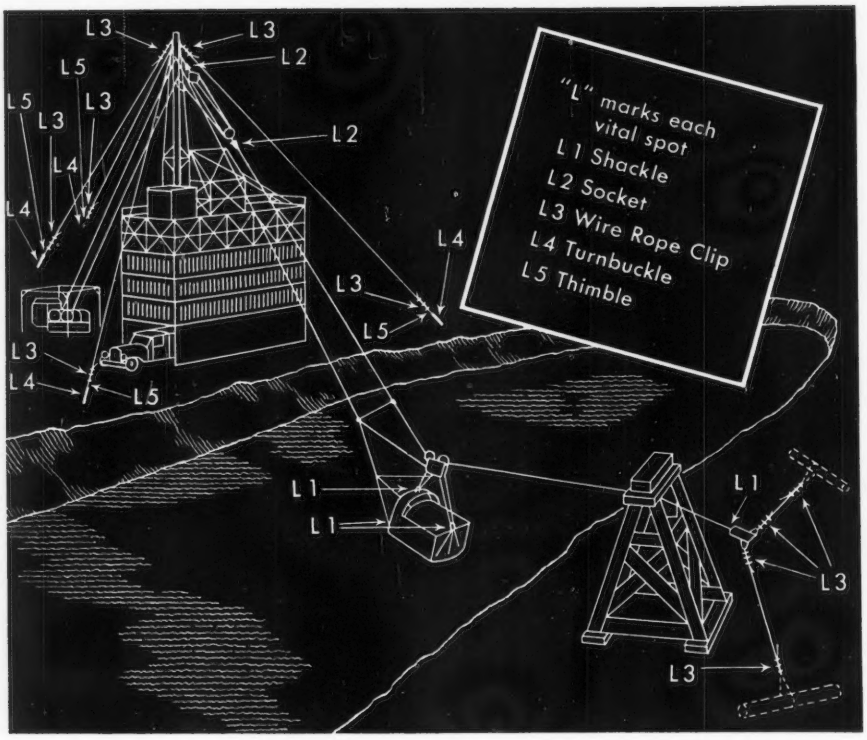

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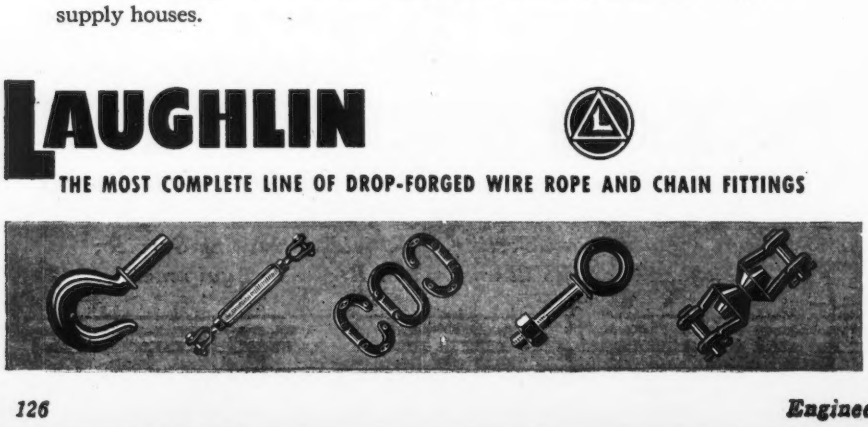

Nevada *(continued)*

shortage has held the operation at little more than one-half capacity. J. J. Lillie, also manager for Anaconda at the Rio Tinto mine of the Mountain City Copper Co., is in charge at Copper Canyon, with office at Battle Mountain, and L. E. Whicher, 25 Broad St., New York, is president of the Copper Canyon Mining Co.

★Standard Cyaniding Co. is preparing to resume operation of its 700-ton cyanide mill and open-pit mine in Pershing County, closed down by Order L-208, with capacity production expected by April 1. Western-Knapp Engineering Co., builder of the plant, is proceeding with installation of larger jaw and gyratory crushers, a rod mill, weightometer, conveyor belts, and with repairs to settling tanks and filters. Some 60,000 cu. yd. of overburden will be stripped before contractors resume open-pit mining and trucking ore to the plant.

★A crew is being assembled for resumption of mining and operation of its 150-ton cyanide mill by the Dayton Consolidated Mines Co. below Silver City, in Lyon County. For several years prior to its closing by Order L-208 the mill had been the State's foremost processor of custom ores, serving a wide area and treating the product of three mines operated by the Dayton company. William Henley, of Virginia City, is manager.

★Eagle-Picher Mining & Smelting Co. has filed its charter with the office of the Secretary of State of Nevada, as required by law of "foreign" corporations transacting business in the State. Similar filing was said to have been made with the clerk of Humboldt County, indicating that Eagle-Picher, which has main offices in Wilmington, Del., has acquired interests in that area.

★Consolidated Goldacres Co., with open-pit gold mine and 400-ton cyanide mill in the Bullion district, Lander County, operated by Willow Creek Mines Inc., Walter Lyman Brown, president, has installed larger grinding units, including a Marcy ball mill moved from a Colorado plant. Clyde T. Harvey, superintendent, reported a crew of 35 men employed and predicted early capacity operation.

★American Chemical Co. has leased one of the metal units of the Basic Magnesium, Inc., plant at Henderson for manufacture of an unspecified product on a "long-term" basis, according to a statement by H. H. Gillings, manager for J. M. Montgomery Co., which holds the huge plant under an agreement with Defense Plant Corporation. He said American Chemical will use aluminum chloride produced at the plant by the New York-Ohio Chemical Co. and chlorine produced by the Stauffer Chemical Co.

★Property of the Simon Silver-Lead Mines, Inc., in eastern Mineral County, idle for a number of years, has been

leased by Sheriff Lloyd Wilson and John H. Simpson, both veteran miners of that region. The main shaft has been equipped with a hoist and compressor, several carloads of lead-silver ore have been shipped, and production is expected to be maintained at a carload daily.

★The Natomas Co. is preparing to operate a 5,000-cu. yd. dragline dredge on ground known as the Greenan placer, at the outlet of Copper Canyon, 16 miles south of Battle Mountain, Lander County. The dredge had been assembled when Order L-208 halted work. This unit will operate in the lower canyon, and Natomas has announced plans to provide later a bucket-line dredge of major capacity on the broad alluvial fan below the canyon. The ground was acquired under 25-year lease from J. O. Greenan, of Reno.

★U. S. Vanadium Corporation has taken an option from B. L. Davis, of Winnemucca, on the old Alabama low-grade gold mine at Awakening, Humboldt County, Davis reported. He said the purchase price was $300,000, with a cash payment the balance in royalties. The mine, a mile from the famed Jumbo of George Austin, will be worked by the open-cut method.

★The gold property known as the Bunker Hill mine, 10 miles south of Virginia City and east of Carson, has been acquired under 35-year lease by W. J. Loring, mining engineer and mine operator, from B. E. Sweet, of Hayward, Calif. Old tunnel workings, plainly opened by Mexican miners many years ago and aggregating some 2,000 ft. in extent, expose for a long stretch an ore channel or lode in andesite, up to 50 ft. wide, the filling composed of highly brecciated quartz and oxidation extending to less than 70 ft. in depth. Sampling has indicated the quartz mass to be of good mill grade. Mr. Loring, with headquarters at the Golden Hotel, Reno, is providing mine equipment and preparing to sink a shaft near the footwall, the Mexican miners having done no work excepting a little underhand stoping below the adit level.

★Tungsten claims adjoining the productive ground of the Nevada-Massachusetts Co. in Pershing County have been taken under lease and option from Phil Forge, of Lovelock, by George W. Kerr and James E. Atchison, mining engineers formerly active in the Philippines in association with James O. Greenan, now of Reno. Forge has accomplished a considerable amount of development work, exposing scheelite of profitable grade. Kerr and Atchison have equipped the property and will prospect at depth by drilling.

★Equipment for a major-scale gold placer operation is being provided at the Round Mountain mine, in Nye County, by Guy M. Standifer and San Francisco associates, who during around two years of test drilling and shaft work are said to have proved some 40,000,000 cu.yd. of pay gravel.

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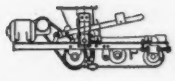

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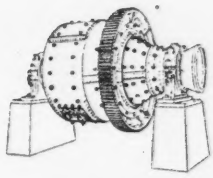

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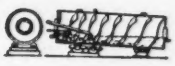

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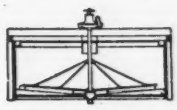

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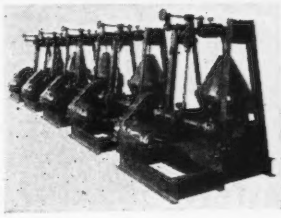

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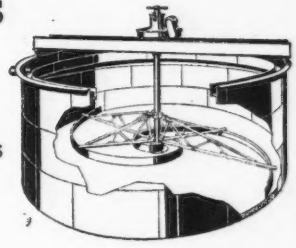

• DRYERS
"RUGGLES-COLES"
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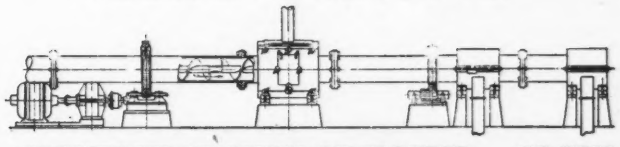
ROTARY KILNS
ROTARY COOLERS

• ROTARY CONVEYORS



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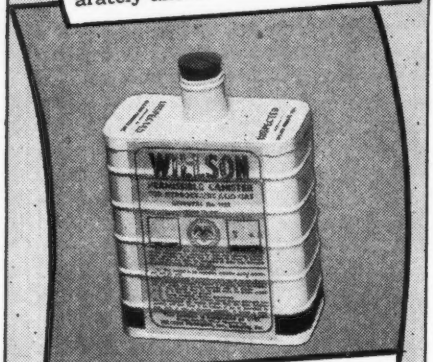

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Nevada *(continued)*

One shaft, down 300 ft., is being sunk to bedrock. A 10,000-cu.yd. washing plant is to be provided, and gravel will be delivered by truck and conveyor belt.

★Property of the Tonopah Belmont Development Co., second-largest producer of the Nye County silver district, has been taken under option by James B. McConnell and associates, of El Paso, Tex., from F. W. Handell, of Shafter, Calif., and the Gipsy Queen shaft has been reopened.

UTAH

Explosion wrecks Barber gilsonite workings — Utah iron production decreases with Geneva shutdown

★District Union No. 2, International Union of Mine, Mill & Smelter Workers, CIO, made formal request Oct. 4 for a secret strike ballot covering almost all the non-ferrous mining and smelting industry in Utah and part of Nevada. The request was made by telegram to the National Labor Relations Board, the War Labor Board, and Louis B. Schwellenbach, Secretary of Labor. Major issue involved is the union's insistence that wage rates in Utah and Nevada be raised to the level of those in the Coeur d'Alene district of Idaho. The union publicity committee said negotiations had been under way since May 15, with no agreements being reached. Because of the manpower shortage, the industry is continuing the six-day week and the union is not advocating a reduction.

★Charles A Howe, Utah-Nevada Tungsten Co., Mesquite, Nev., and associates of Los Angeles, have acquired the Old Hickory mine and the School tungsten mill near Milford, Utah, under bond and lease. They plan to ship copper ore from the Old Hickory mine to the Garfield smelter of American Smelting & Refining Co., and to rehabilitate the School property. Mr. Howe is directing operations.

★Explosions of major proportions, heard and seen at the town of Vernal, 50 miles northwest, wrecked the Barber Asphalt Co.'s gilsonite workings at Bonanza, Utah, on Oct. 9, causing property damage estimated at between $50,000 and $100,000. No one was injured seriously. The explosions shot large mine timbers and rocks so high into the air they were falling five minutes after the blast. The mine timbers, crashed through the roofs of eight occupied houses, but providentially damaged property only. The following day all 14 shafts of the mine were belching an inferno of flame and smoke. The blaze in shaft No. 2, where a terrific explosion touched off the conflagration about 9:05 p.m. Oct. 9, was isolated from the other 13 shafts and brought partly under control by smothering it with tons of earth, L. D. Barry, mine manager, reported the evening of Oct. 10. Gravest danger, he said, was that a shifting wind might wipe out the entire community. Up to that time mine employees and volunteers from as far away as Vernal had worked continuously to save the homes. Major damage was to a large warehouse built over one of the shafts, which was totally destroyed, and the equipment in the two shafts being worked. Electrical lines were wrecked, but the water system was undamaged. A standby electrical system was put to use and telephone service was restored after a temporary interruption. All men were outside the mine at the time of the explosion, which followed regular blasting operations. The Bonanza explosion is the second within six months to occur in the Uintah County gilsonite mines. Three men were killed in an explosion at the Rainbow gilsonite mine, 15 miles south of Bonanza, last April and a large fire was created in a vein of gilsonite.

★Reconstruction Finance Corporation has no intention of continuing operation of the Kalunite, Inc., plant in Salt Lake City, beyond Nov. 3 unless plant operators demonstrate before that time that they can produce some form of potassium as a byproduct of their alumina process in volume and at a price to make the plant operation feasible commercially, according to an announcement on Oct. 6 in Washington, D. C.

★The Western States Council, representing Chambers of Commerce of 11 Western states, adopted a resolution Oct. 8 concurring in the report of the Surplus Property Board to the effect that government-owned aluminum plants be sold to the highest bidder. Capt. Robert T. Banks, Jr., announced at the council meeting held in Salt Lake City, that Hybinette & Cary, of Wilmington, Del., and associates are negotiating with Chairman W. S. Symington of the Surplus Property Board to purchase all the aluminum (alumina, pig and fabrication) plants built during the war and to operate them with private capital. Captain Banks did not disclose the source of capital for the program but said the group he represented proposed to do the job with private capital, at private risk, and without subsidy. He said the principals believe that under competitive conditions the price of pig aluminum could be brought down to 12½c. per pound, thereby enormously increasing the market.

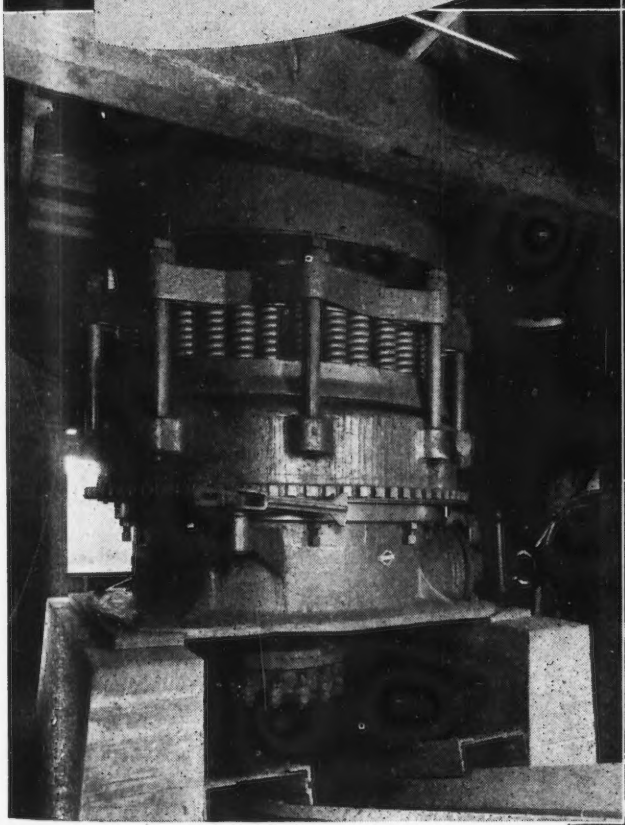
The light metals committee of the council worked out its report, which was approved without alteration, at an all-day meeting. Spokesmen for Alcoa, Reynolds Metals Corporation, Columbia Metals Corporation, and Olin Industries were heard. Charles R. Boyle, of Seattle, representing Alcoa, and Keen Johnson, former Governor of Kentucky, and a Reynolds Co. vice president, clashed several times on the matter of a supposed monopoly held by Alcoa. Reynolds Corporation has sub-

IRON ORE MINE GETS

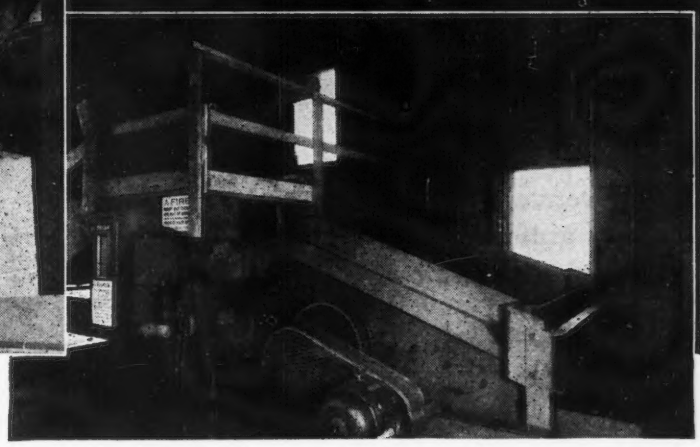
finer reduction

Virginia Mine at Eveleth, Minn., operated by Snyder Mining Co. of Duluth, Minn.

...with new TELSMITH secondary CRUSHING PLANT



48" Telsmith Gyrasphere Secondary Crusher



5' x 12' Telsmith Double Deck Pulsator

The Snyder Mining Company's *Virginia Mine* is an important source of iron ore for consumer owners.

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In co-operation with Snyder engineers, Telsmith designed a thoroughly modern and complete secondary crushing plant . . . from preliminary layouts to final detailed construction drawings . . . and furnished all equipment.

The primary crushing plant's product now goes to a 5' x 12' Telsmith double deck Pulsator screen. Fines pass through onto a belt conveyor. All material over 1½" goes to a 48" Telsmith Gyrasphere Crusher, with standard concave, which reduces it to minus 1½". The entire new plant product passes to a railroad car loading bin. The plant also includes 30" x 57' 6", 30" x 27' 6", and 36" x 12' Telsmith B-G Conveyors.

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Utah *(continued)*

mitted bids for lease of the plants. Although the Reynolds Co. was not named in the report adopted by the council, one recommendation urged that negotiations with this or an equally qualified bidder be concluded within 30 days. The light-metals committee, upon completion and acceptance of its report on the aluminum industry, was asked to make a similar study with reference to magnesium and potash plants.

★Iron-ore output in Utah slumped from 162,979 tons in June to 148,091 tons in July, with indications this would plummet further in August and September, due to the virtual shutdown of Geneva Steel Co. The plant was authorized to continue operation of one battery of coke ovens and one blast furnace in a telegram received Oct. 10 by Walther Mathesius, president, from Defense Plant Corporation. Rolling-mill operations are to end when present demands for plate steel are filled. Chairman Symington of the Surplus Property Board told U. S. Representative J. W. Robinson (Dem.), Utah, on Oct. 10, that he has signed a report laying down a policy which the members of the board believe should govern disposal of all government-owned steel plants. The chairman indicated the report would go to Congress promptly. None of the steel plants may be sold or leased until 30 days after the report reaches Congress.

★The Murray smelter of American Smelting & Refining Co. is expected to resume operations in November if supplies of ore and the labor situation do not change for the worse, Kuno Doerr, Jr., assistant manager, Utah department, said late in September.

★Organization of the American Diamond Drill Co., with headquarters in Salt Lake City and production of diamond drills expected to begin early in 1946, was announced Sept. 30. President of the new concern is C. L. Christensen, managing partner of Christensen Machine Co., for many years manufacturers of drilling equipment for Boyle Bros. Drilling Co., general drilling contractors. C. L. Lindhe, manager of Boyles Bros., is vice president, and Frank L. Christensen, manager of Christensen Diamond Products Co., is secretary-treasurer. J. A. Jacques, assistant purchasing agent for Star Defense Corporation since 1941, will manage the new company, the address of which is 1975 South 2d West St., Salt Lake City.

CALIFORNIA

1944 production largest in history — Dredging and hydraulic operations prepare to resume

★According to a report released recently by the State Mining Bureau, headed by Walter W. Bradley, State

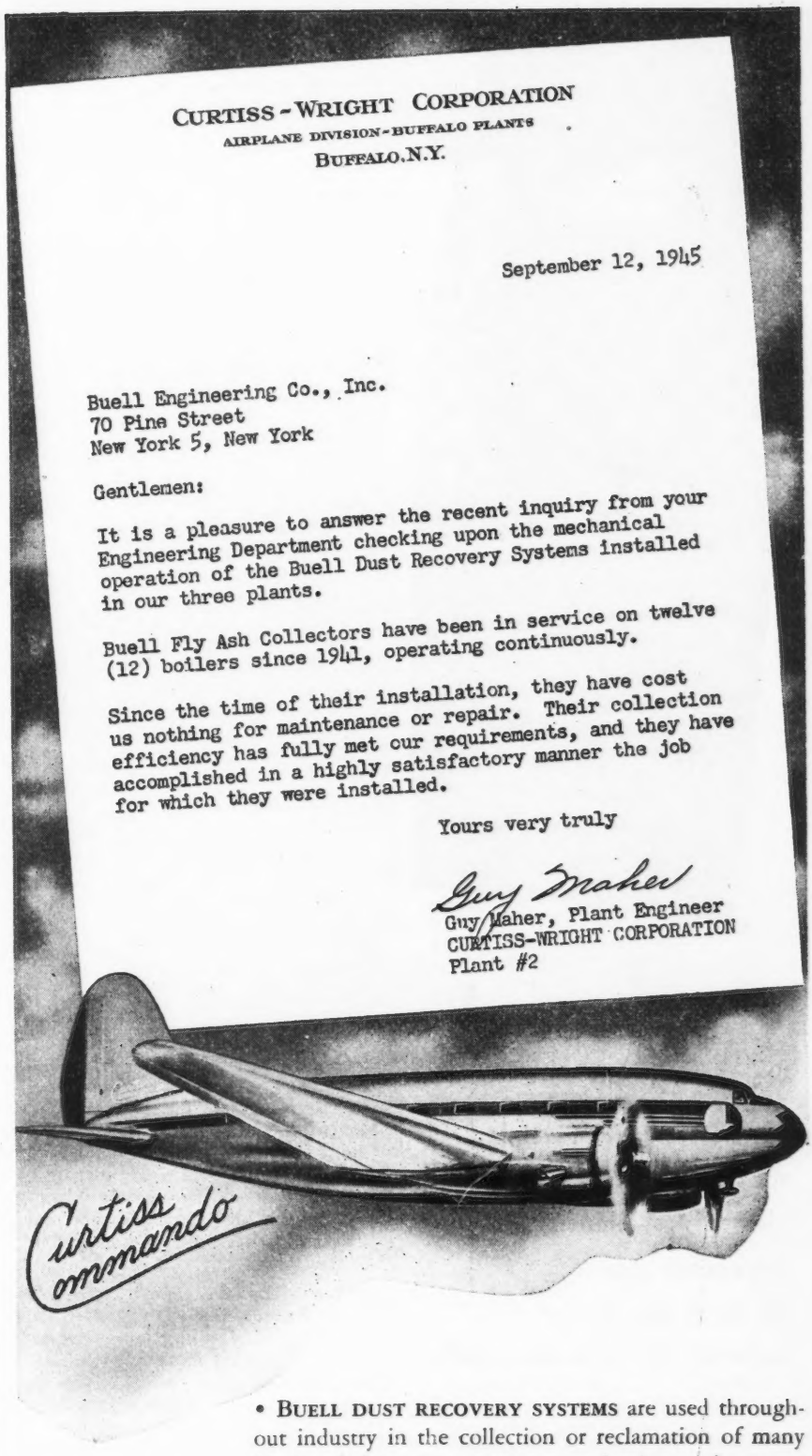
Mineralogist, California mineral production in 1944, amounting to a total of $469,774,525, was the largest in the history of the State. Increases in total value were registered by such groups of mineral substances as fuels, industrial materials, and salines. Metals and structural material showed a decline in total value. Of the metals, an increase in annual value was recorded by copper, lead, manganese ore, silver, and zinc. All others showed a decline in amount and value from 1943. The value of gold yield decreased from $5,191,480 in 1943 to $4,108,055 (117,373 oz.), which is the smallest production since the discovery of gold in California in 1848. Copper output was 25,584,865 lb.; lead, 11,408,381 lb.; zinc, 16,465,103; silver, 775,936 oz.; quicksilver, 28,097 flasks; and tungsten, 203,965 units. Of the structural materials, the group as a whole decreased from a total value of $55,055,016 in 1943 to $50,777,220. Industrial materials increased in total value from $10,656,288 in 1943 to $11,515,327 in 1944.

★Underground development involving sinking of a winze and crosscutting is under way at the Alaska gold property at Pike, Sierra County, operated by H. L. Sorenson, of San Francisco. The mine was unwatered following reopening last June by R. J. Kohlen, formerly in charge, and operations will be expanded as more men can be obtained.

★Preparatory work including repair of a ditch has been started by Northwest Mining & Engineering Co. on the South Fork of the North Fork of the Yuba River in Sierra County with a view of having full-scale hydraulic operations going by November. Activities are centered on the properties acquired from E. A. Humphreys and John Romano recently. A supply of 22- and 24-in. pipe has been ordered and an Allis-Chalmers bulldozer moved to the property. About 20 men are expected to be employed when regular operations involving removal of 4,000 yd. of gold-bearing gravel a day with two hydraulic giants are in progress. The work is directed by F. E. Nemec, company engineer, and E. C. Dutlaw, superintendent.

★Marter Mining Co. is reported to be mining aluminum silicate by open-pit methods from the Marter White property near Victorville, San Bernardino County, with mine output being shipped to custom mills in Los Angeles. L. B. Martin, with offices at 530 West Sixth St., Los Angeles, heads the company, and R. M. Richter is vice president and general manager.

★Junction City Mining Co., H. L. Sorenson, president, expects to resume dredging in the near future on the Trinity River, Trinity County, where the company operated a 9-cu.ft. bucketline dredge until suspension of gold-mining operations. The dredge has been maintained in good working order, and Derby Wilson, superintendent, has returned to the property to assemble men to start work.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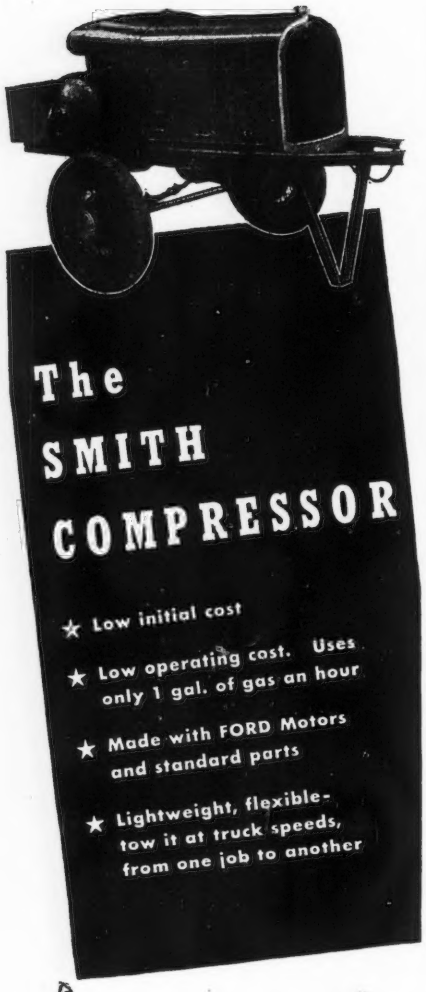
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California *(continued)*

★Errol MacBoyle and Mrs. MacBoyle recently filed in the Nevada County Recorder's office deeds to one-half interest in the Champion, Mountaineer, Gold Tunnel, Red Hill, and Reagan mines, in Nevada County. The deeds were executed by the late Carl P. Jones in February 1945. A deed to a half interest in the Mountaineer group was filed by Mrs. MacBoyle and a deed to the remaining property by Mr. MacBoyle. The properties cover some 1,200 acres and are contiguous adjoining Nevada City on the northwest, with some of the mineral claims underlying the city. The other half interest in the holdings is held by Dr. Jones' estate. The Champion and Mountaineer groups were noted gold producers many years ago. Errol MacBoyle is vice president of Idaho Maryland Mines Corporation, residing at Grass Valley.

★Operation of the Gold Ribbon mine, in the Coarsegold district of Madera County, has been resumed by J. A. Hassell and associates. On the property is a stamp mill equipped with amalgamating and concentrating units and a reserve of milling ore is available for mining. A comprehensive development program is to be undertaken as soon as labor and supply conditions become more normal.

★A crew is at work dewatering the Dannebroge shaft of the Pennsylvania mine of Empire Star Mines Co., Ltd., in Browns Valley, Yuba County. The shaft is some 1,500 ft. deep and was allowed to fill with water after suspension of operations in 1942 brought about by WPB's gold mine closing order. Walter Renyer, foreman, is in charge.

★Gypsum Company of California, V. O. Punches, president and general manager, has started operations on a deposit near Buttonwillow, Kern County, containing agricultural gypsum. Equipment is being installed, and delivery of gypsum to agricultural properties is expected soon. The newly organized company is also reported to be seeking leases of other gypsum deposits in the State.

★According to a report from Nevada City, Baroid Sales Division, National Lead Co., is planning increased output following recent assignment of a lease on the Singleton claim at the Spanish mine, near Washington, Nevada County, to National Lead by Industrial Minerals & Chemical Co., of Berkeley, Calif., which had held the lease on the Barite claim from the Bradley Mining Co. of San Francisco. The Spanish mine, including its gold claims, was recently acquired through purchase by L. R. Moretti, manager of Industrial Minerals. Bonadiman-McCain, Inc., engineers and contractors of Los Angeles, have been awarded a contract to mine barite at the property, and construction of a treatment plant at Auburn is planned. Barite ore mined currently is trucked to Auburn and then shipped by rail to Industrial Minerals' plant at Berkeley. L. N. Benson, superintendent, is in charge of operations.

★According to word received from Lonely Camp, a rich deposit of gold ore has been discovered in the Dempier mine by Tony De Mayo, who has prospected the region for many years. The deposit is being examined by engineers, as it is considered in what was known as the Lost Pedro mine, worked in the '70's. It is situated about five miles from Ridgecrest, Kern County, just above the new Naval Base.

WASHINGTON

University offers prospector's course — Industry problems discussed at Northwest meeting.

★A prospector's course offered without examination to all men past high-school age has recently been started at the University of Washington College of Mines. The course covers prospecting as it is commonly understood and includes the elements of geology, mineralogy, chemistry, and metallurgy. Mine maps and motion pictures will be used to present the course. Practice with standard mining and milling machinery, microscopes, furnaces, and other equipment in the Mines laboratory will be included. Field trips to mining operations, the Tacoma smelter, and other metallurgical plants will be made. The course will be continued until Feb. 23, and extended from March 1 to June 25 for those who can remain longer.

★At an October meeting of the Northwest Mining Association, Frank Eichelberger, consulting engineer operating out of New York and in the Tri-State district, stated that Spokane is most favorably situated for a successful mining future. He predicted that lead and zinc prices would rise to 10c. a pound or more. To illustrate that mechanical devices are replacing labor in mining, he cited one mine where 22 men now produce the same amount 125 men formerly did.

At an earlier meeting of the association, Lieut. Edward J. Bloom, recently retired from the U. S. Navy, said that the Columbia Valley Authority Plan, if adopted, will end freedom of search, exploration, acquisition, and development of mining under favorable laws in the Northwest. Walter W. Malone, former attorney for S.E.C., stated that Baldwin B. Bane has a greater grasp of the Securities law than anyone else, and that the fear that S.E.C. will put anyone out of business is disappearing.

★The Federal court action in which the United States sought damages from Northwest Magnesite Co. for alleged injury to the property of Indian wards of the government, in Stevens County, has been settled out of court. The Government instituted this action in March, and claimed that dust and

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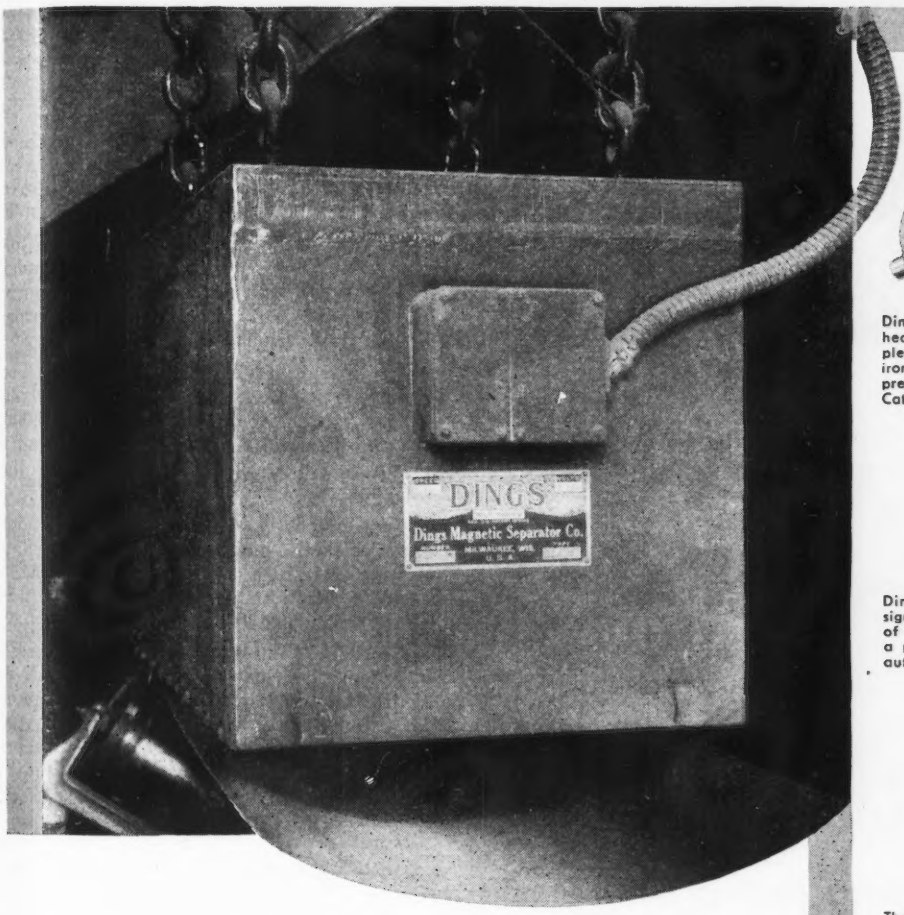

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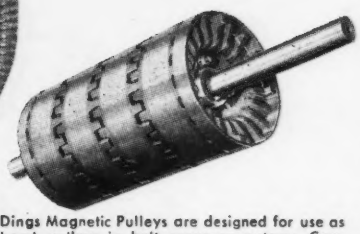

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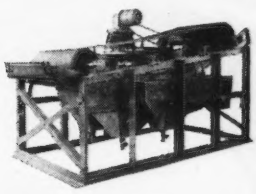

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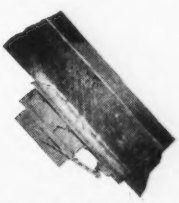

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Washington *(continued)*

gases from the company's magnesite plant, at Chewelah, had lessened the productivity of 620 acres to the extent of $3,840 in crop rental loss and $11,625 in cash rental.

★Art Garton, director of the State Department of Conservation and Development, has announced that light metals studies and experimental work will be continued at Washington State College without change under the new division.

★Engineers, representing Henry J. Kaiser, have inspected the Mead and Trentwood light-metals plants. Approximately 600 men are still employed at the Trentwood aluminum sheet mill.

★Heirs of M. G. Swanson have appealed from the decision of Judge Lewis B. Schwellenbach in the government's action over the dolomite property in Stevens County.

★Western Light Metals, Inc., has filed its articles of incorporation at Olympia, with a capitalization of $10,000, and will operate a light-metals foundry in Spokane. C. L. Wheeler heads the concern.

★Kenneth Mackentosh and associates of Seattle have incorporated Wenatchee Mining Co. with a capital of $18,000. The purpose of the organization is to operate gold and silver mines.

★N. R. Wimmler has been transferred from the Seattle office of the U. S. Bureau of Mines and put in charge of such work as will be continued by the Spokane office. Work will be directed hereafter from the Bureau's headquarters at Albany, Oregon, where S. H. Lorain is in charge.

OREGON

Magnetometers aid black-sand surveys — Potential alluvial gold areas are reviewed

★Cooperative surveys by the Oregon Department of Geology and Mineral Industries and the U. S. Bureau of Mines of black sands of the southwestern coast of Oregon have established the magnetometer as a useful tool of exploration. The research covered a wide area on the coast from Coos Bay south to Port Orford, in Curry County, where the demand for chromite brought extensive development of the known deposits.

★Eastern Oregon contains some gold-bearing alluvial areas which have received little attention since early days, according to a report by the State Department of Geology and Mineral Industries. J. Ross Browne says early mining, because of difficulty in securing water, was by small-scale operations. Some of the "high bars" now are said to offer possibilities of large-scale operations, and the State Department

says investigation seems to be warranted. New discoveries continue to be made in the John Day and Powder River areas, which until two years ago produced more than $1,500,000 annually. The Easton district, east of the Shasta district, was organized last summer. It contains many gulches which formerly produced. The gold is fine and the bedrock is a cement of clay and gravel. East of the Easton district is the Willow Creek district, with gold in paying quantities found in one of its gulches. Water is scarce, coming chiefly from melting snows during two or three months of the spring. Ditches to bring water from Willow Creek and Burnt River are being discussed.

★Semi-precious gems are again being gathered in the Crooked River district, near Bend. Geologists say the stones are chips from ancient lava beds and have been rolled, whirled, and washed along subterranean rivers for centuries.

IDAHO

Sunshine Mining Co. opens Silver Syndicate vein—Monitor buys Interstate-Callahan group

★The Silver Syndicate vein has been opened by the Sunshine Mining Co. on the 3,700 ft. level 4,000 ft. west of any other deep discovery on what is known as the Chester-Silver Syndicate vein and fault system. In the Polaris mine workings, where the vein was first discovered, the rich ore occurs in a vein branching off from the fault easterly into Polaris and Silver Dollar ground, and continues westerly into the Silver Syndicate property, where it joins the fault system. Sunshine has proved by diamond drill work that the fault is also ore bearing, and much farther to the west. Several drill holes have revealed a wide shear zone containing streaks of high-grade silver-lead ore. The first tunnel opening into the area is a crosscut 275 ft. north of the Sunshine's Jewell shaft on the 3,700 level. This opening shows 10 to 20 in. wide of high-grade lead-silver ore on the footwall of the vein. Sunshine owns a one-half interest in the ore produced from the Silver Syndicate holdings. In doing the necessary development work on the eastern end of the Silver Syndicate vein the company extracted ore valued at $214,629.67.

★Polaris Mining Co. is sinking the Silver Summit shaft with the use of a clamshell bucket mucking device patented and manufactured by the E. J. Longyear Co. of Minneapolis. The outfit is mounted on a steel frame attached to the last set of timbers in the shaft and consists of the clamshell digger and two electric motors on a movable carriage. One motor operates the digging and dumping of the clamshell while the other moves it forth and

MR. CLOG SCRAMS Everytime a DIXIE NON-CLOG HAMMERMILL IS INSTALLED

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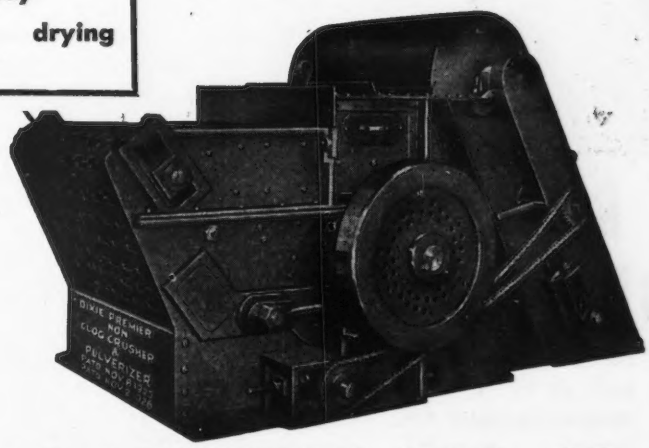

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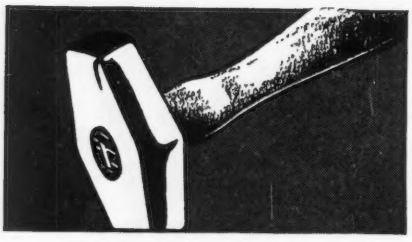

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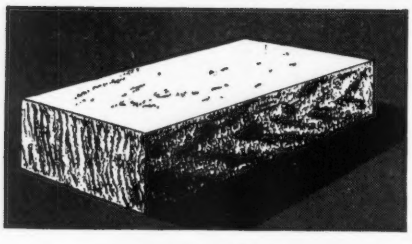

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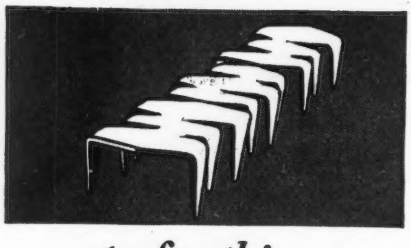

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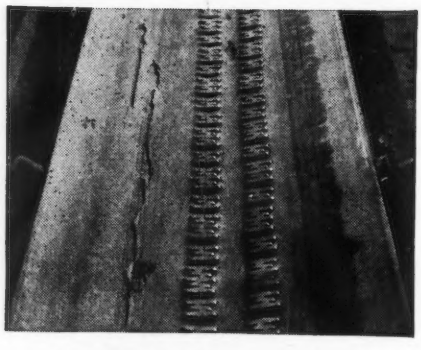

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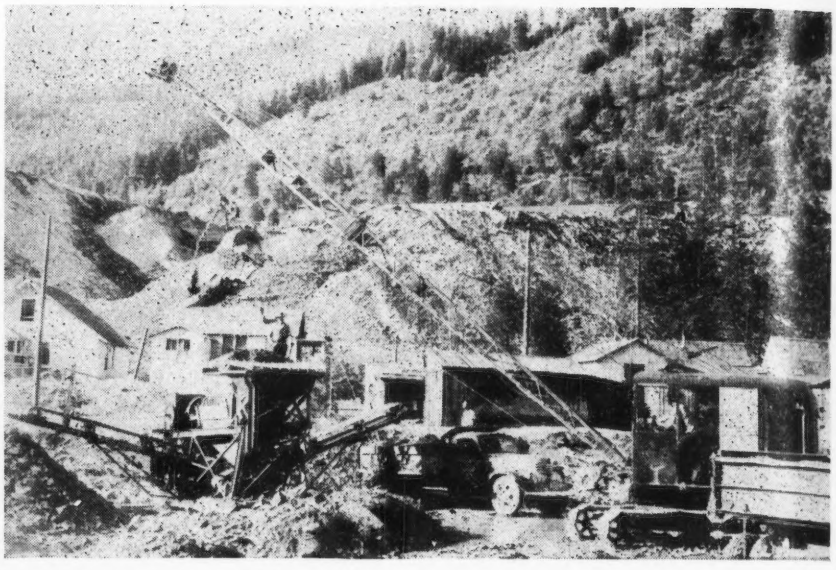


MECHANICAL EQUIPMENT employed to treat tailings from Morning mine, Mullan, Idaho.

Idaho *(continued)*

back in the shaft as desired. The clamshell dumps in a 1¾-ton hoisting bucket attached to the main hoisting system. Two of these buckets are to be used, one being filled while the other is being hoisted. The shaft contains three compartments, and is now down to the 1,500-ft. level. Polaris will sink it to the 3,000 level, from which point a long crosscut will be driven south in an effort to locate the Chester vein system 2,500 ft. east of the present Polaris productive area, which has already produced several million dollars.

★Gold Hunter Mining Co., at Mullan, has awarded a contract to Clarence Nelson and William Coumerilh, Jr., for removal of the Hunter tailings and sorting belt dumps to mill ore bins, from which it will be sent for treatment for its low-grade silver and lead values. The dumps contain several thousand tons of the material.

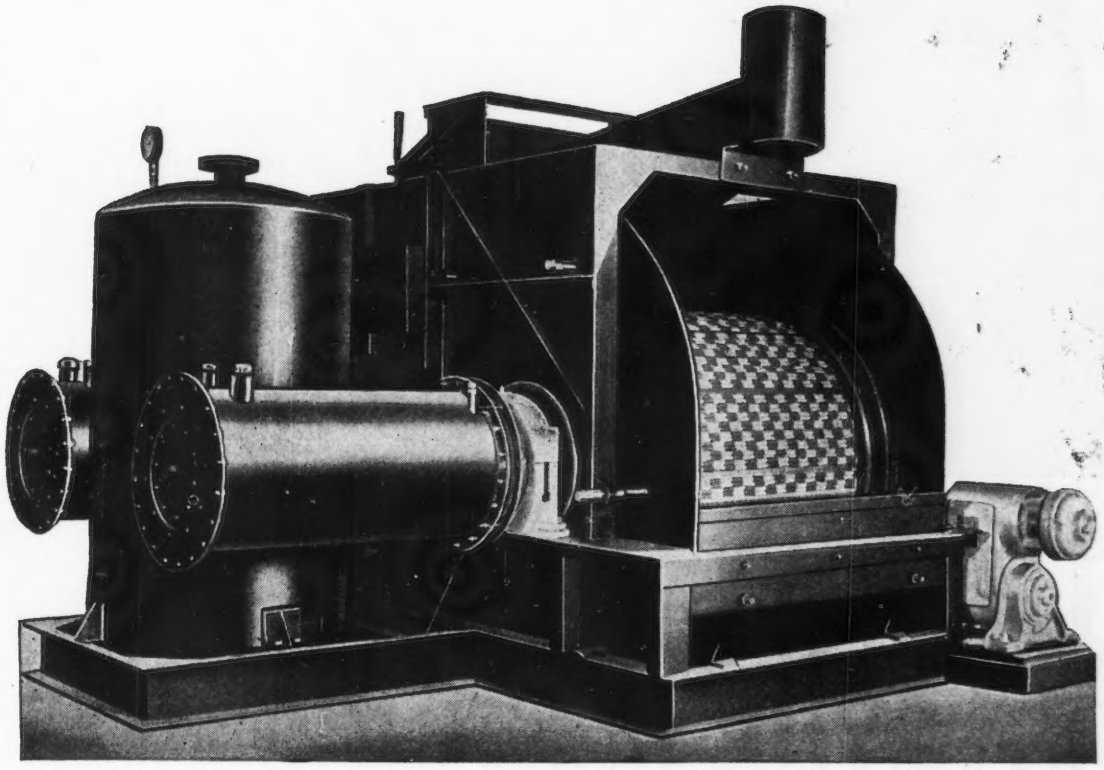
★Monitor Mining Co. has recently purchased the old Interstate-Callahan group of 79 patented and four unpatented mining claims in the Sunset Peak district north of Wallace from the Callahan Zinc-Lead Co. The property was a famous zinc-lead producer during the first World War, and from 1915 through 1920 paid dividends aggregating $7,721,688.25. The mine was closed Sept. 30, 1923, and has not been operated since except by leasers. Monitor Mining Co. is controlled by the Day mining interests and has purchased the Old Interstate-Callahan as an outlet for productive Monitor mining operations in the Beaver Creek section of the Coeur d'Alenes, from which area it is now necessary to haul all concentrates and crude ore by truck. Underground Monitor and Interstate-Callahan workings can be connected with an 1,800-ft. drift, which work is now under way. The Monitor company plans to prospect the old Interstate-Callahan veins at greater depth than that worked by the old company.

★More old tailings have been recovered and treated in the Coeur d'Alene district in the past two years than ever before. Huge mine dumps have disappeared and the main creek bed of the south fork of the Coeur d'Alene River, which passes through the district, looks like a gold-dredging stream. Dredging shovels have been digging to bedrock in the river bed, where they claim to have found a concentrated tailings product up to 4 percent lead and better.

★The U. S. Bureau of Mines has stopped all diamond-drill prospecting in the Coeur d'Alene district. Bureau engineers engaged in drilling operations at the Little Pittsburgh property on Pine Creek received orders to suspend all operations and move the Bureau's equipment from the district. No reason was given for the order, whether it was a scarcity of funds or the lack of war demand for zinc. The crew at the Little Pittsburgh were engaged drilling a hole which was within 100 ft. of completion when the order came. Drilling was immediately stopped and the equipment removed. The Little Pittsburgh Co. will continue the work with the same operator and another machine. The U. S. Bureau of Mines has done much diamond drill work in the Pine Creek area recently, and has located several important bodies of zinc ore, the most notable of which is at the Sidney mine, where a body of high-grade zinc-lead ore over 1,000 ft. long and up to 12 and 14 ft. in width has been developed through information gained from the drilling operations.

★Several small mines in Idaho have changed management recently. At the Spokane-Idaho zinc-lead property on Pine Creek, Charles R. Garrett, Jr., has been placed in charge as manager and has increased production of the property to 400 tons of concentrates per month. Compton White, Jr., has silver-lead mine, at Clark Fork; Frank R. Mitchell, formerly with the White

Peterson Syncro-Drum Filters Increase Output and Lower Process Costs



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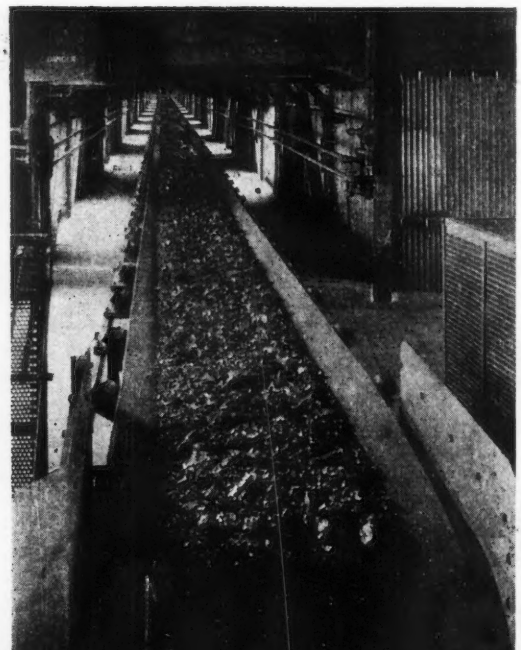

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Idaho *(continued)*

Knob mine, at Republic, Wash., has been named manager of the Highland-Surprise property on Pine Creek, and Joseph V. Grismer, mine manager for the Callahan Consolidated property, has been named manager of the Merger Mines property in this district.

★Hunter Creek Mining Co. has made a deal with the Lucky Friday Silver-Lead Mining Co. in the new Mullan silvert belt, whereby the Hunter Creek Co. will pay half the cost of sinking the Lucky Friday shaft 400 ft., from the 1,000 to the 1,400-ft. level and half the cost of driving a drift easterly on the vein to the Hunter Creek claim lines. The shaft will be three-compartment size and work will start immediately. The agreement provides for the working of the Hunter Creek property through the Lucky Friday shaft after the contract work is completed. From this new deep level Lucky Friday will also drive a shaft westerly on the vein to the end lines of the Lucky Friday Extension property, in which Lucky Friday owns a one-half profit production interest.

★The Hypotheek and King of Pine Creek mining companies have been doing extensive bulldozer prospect work recently in an effort to locate the Hypotheek vein east of the Placer Creek fault, which cut off the Hypotheek orebody.

★The Silver Dollar Co. announces it will pay its stockholoders owning "A" stock the sum of $30,000 as a partial return on money formerly paid in on assessments. The money will be paid Oct. 24 to stock of record Oct. 9.

★Arthur Campbell, State Inspector of Mines for Idaho, has published a revised edition of the mining laws of the State, compiled by Carl C. Kitchen, of Boise. The codification of the mining laws was authorized by the last Idaho State Legislature.

★Metropolitan Mines Corporation has started to extend its crosscut development on the 3,100-ft. level of the Sunshine mine under contract with James Doyle, of Wallace, who will complete 300 ft. of new work. This will give the Metropolitan 800 ft. of crosscut work south of the Yankee Girl vein, which it is estimated will be far enough south to cut the Metropolitan vein. The Yankee Girl vein was cut by Sunshine on the 3,100 level on its downward extension in Metropolitan ground, and because of extralateral rights questions, Sunshine agreed to give Metropolitan 17½ percent of the net profits from production west of the crosscut, in which direction Sunshine developed an oreshoot of minable width for a distance of 800 ft., averaging 19 to 20 oz. silver per ton. Whenever labor conditions become normal, Sunshine will develop this same vein structure to the east of the crosscut, where the division of profits will be 50 percent to Sunshine and 50 percent to Metropolitan.

★Hypotheek Mining Co. is driving a 400-ft. prospect tunnel into Hypotheek ground from French Gulch to open at shallow depth a mineralized surface outcrop discovered in bulldozer operations in a search for the Hypotheek vein east of the Placer Creek fault which cut off the Hypotheek orebody in the old workings west of the fault. Bulldozer trenching on King of Pine Creek Mining Co. property still further east has revealed the same mineral cropping, and the two companies are planning joint diamond-drill operations to determine the value of the discovery at depth.

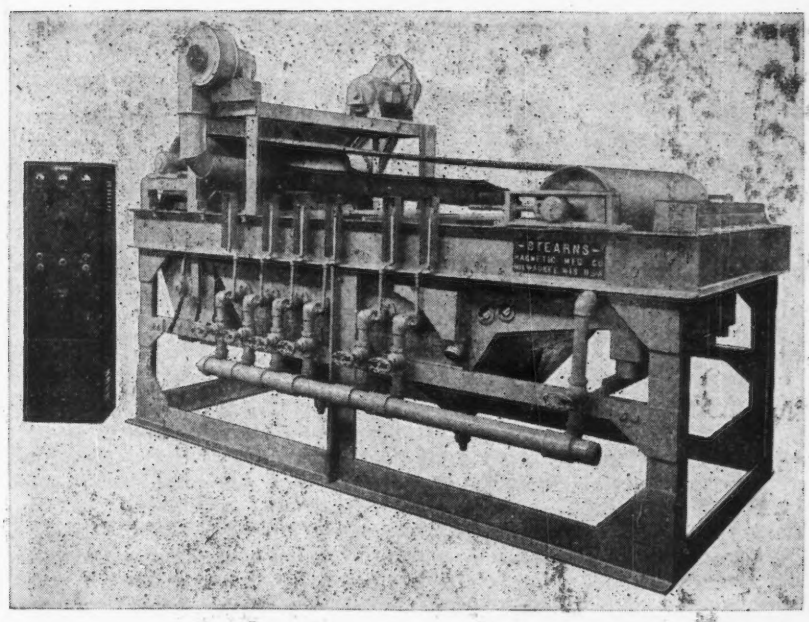
★People of the Coeur d'Alene mining district are deeply and unfavorably concerned over a Government Army Engineer plan to build a dam at Springston, several miles to the west, to impound the waters of the Coeur d'Alene River, which drains this district. The project, as outlined by the Engineers, would back water up to the Bunker Hill Mining Co.'s smelter at Kellogg and would flood some of the company's milling plants. The water level would be 20 ft. over the top of the present No. 10 Highway bridge at the mouth of Pine Creek and would isolate the entire Pine Creek mining area, where a number of mining companies are engaged in the production of zinc-lead ore. Mining engineers also fear the flooding of the lower levels of some of the big producing mines, principally the Page mine of the Federal Mining & Smelting Co., and the Bunker Hill workings.

MONTANA

RFC offers chrome properties for sale—Large phosphate deposit developed near Hall

★The Benbow and Mouat Chrome properties were recently offered for sale by the Reconstruction Finance Corporation. The Domestic Manganese Development Co's concentrator and nodulizing plant at Butte is also offered. RFC placed no price on the properties, but invited any interested companies or individuals to open negotiations. There has been considerable speculation in Montana as to the final disposition of the chrome deposits, which were developed by the U. S. Bureau of Mines and the Geological Survey and later by the Anaconda Copper Mining Co., acting as agents for Metals Reserve. Operation of these mines was suspended by government order after the invasion of North Africa permitted resumption of imports. They have been held on a standby basis until recently. The property consists of more than 300 buildings, including dwellings, mess halls, hospitals, shops, warehouses, concentrators, and production equipment sufficient for mining and processing more than 3,000 tons of ore daily.

★The Lexington mine, one of the old-



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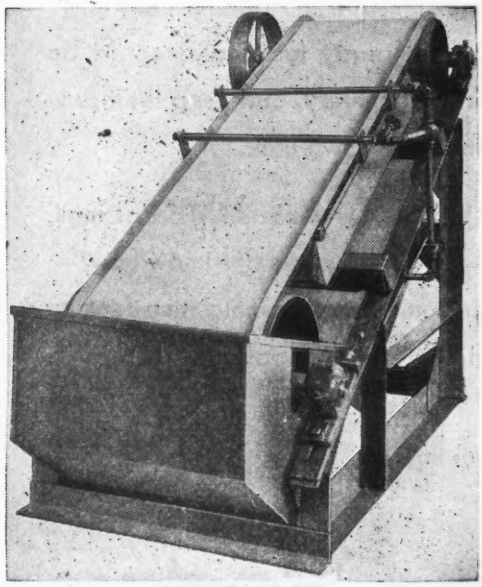

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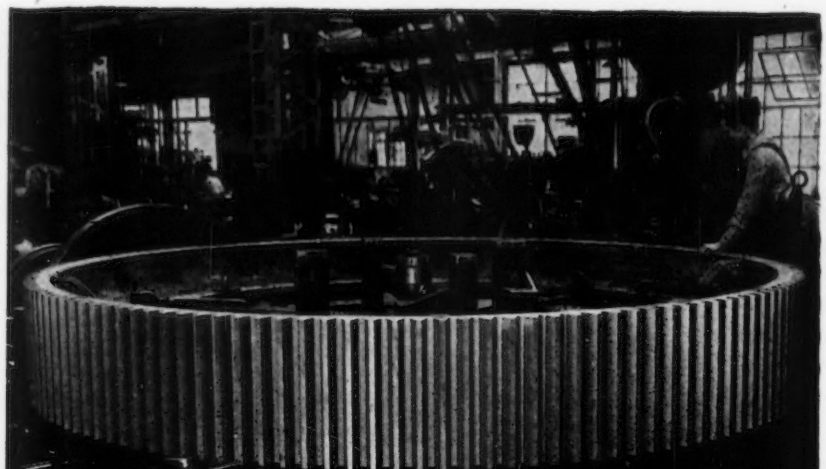

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Montana *(continued)*

time producers in the Rimini district, was recently put into operation by Scotty Palmer, of Helena. Two cars of ore were shipped to the A.S.&R. smelter at East Helena. Shipping ore averages about 40 oz. of silver, 20 percent lead, and 9 percent zinc. At present five men are employed.

★The Armstrong Mining Co., operating in the Rimini district, recently completed remodeling its mill and has resumed operation. Jigs were replaced with modern flotation units, and a new fine-grinding unit was installed. At present old dumps from the Armstrong and the Lee Mountain mines are being treated. The new mill has a capacity of 5 tons daily.

★International Minerals & Chemical Corporation plans to complete remodeling its mill in October and will soon start operating on a basis of 800 tons a day. This company has developed a large reserve of phosphate rock near Hall, Mont. The ore will be concentrated by flotation and the concentrates will be shipped to Trail, B. C., and to the Hawaiian Islands.

★L. B. Stark, superintendent of the Star mine, in the Neihart district, reports finding new ore in the Queen vein. For the past year Stark has been prospecting new properties to develop a source of ore to supply his 50-ton flotation mill on the Star property. The Star vein has supplied his ore for several years but has been practically exhausted. The old Galt adit was rehabilitated, and a crosscut was driven to intersect the Queen vein. At last report, Stark had drifted on ore for a distance of 30 ft. and exposed good face of ore in the drift. Ore averages 4½ ft. in width and samples show values of about 39 oz. of silver, 14 percent of zinc, and 8 percent of lead. The higher grade ore is sorted out for direct shipment to the smelter and the second-grade ore is put through bulk flotation.

★The Silver Butte mine, near Libby, has nearly completed construction of a 35-ton selective flotation mill on the property. The mill is expected to be ready for operation about November 15, and will produce two concentrates from lead-zinc-silver ore. Bill Symons, of Libby, is superintendent.

TRI-STATE

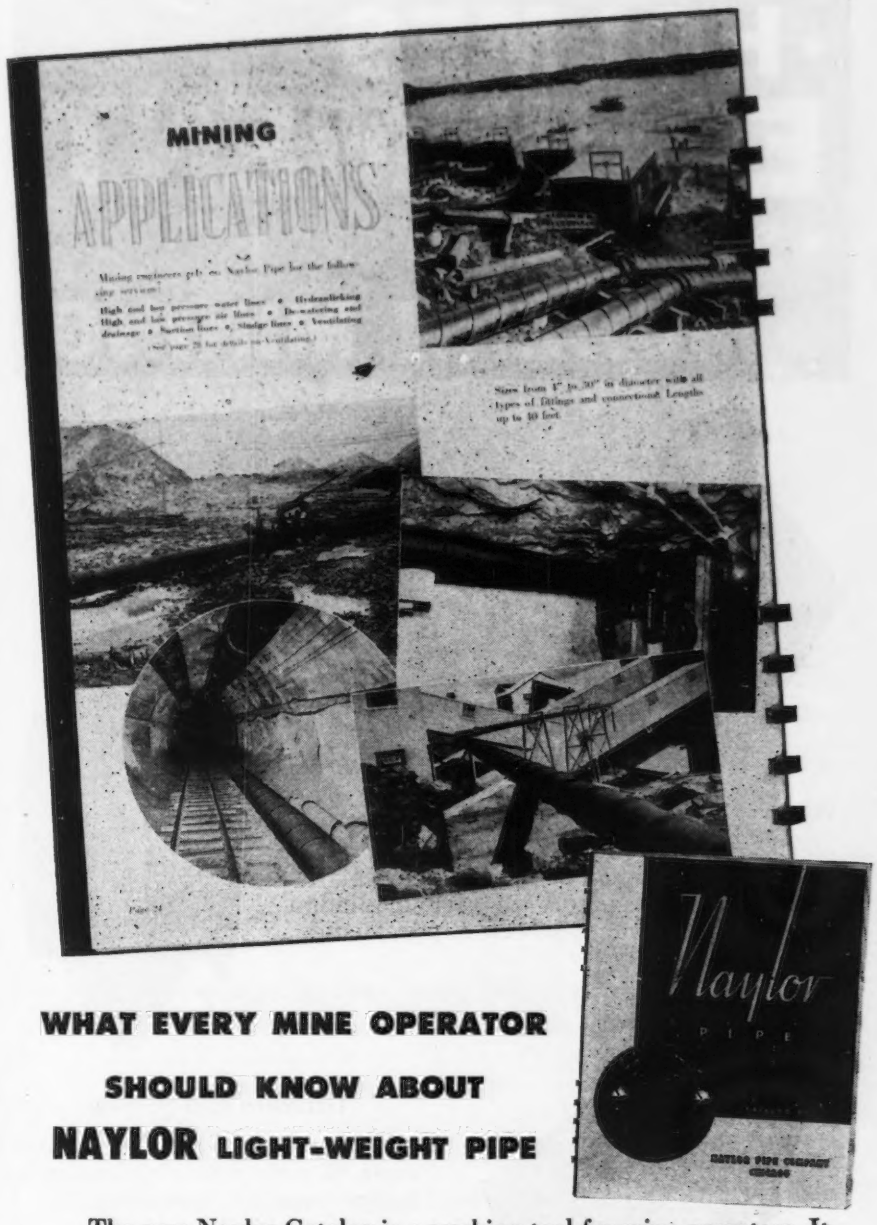
Producers' association inaugurates dust-control program — New shaft to be sunk on Potter ranch

★To prevent silicosis, district mine operators, through the Tri-State Zinc & Lead Ore Producers Association, are inaugurating an aluminum powder-treatment program. The association will be licensed by McIntyre Research, Ltd., to use the organization's patented

process for the prevention and arresting of silicosis. Two primary prerequisites are necessary to put the program in force, according to F. F. Netzeband, industrial hygiene engineer for the association. One is an engineering control program to combat the dust in operations. Members of the association have had this program in effect for the past nine years. The other is pre-employment and periodic examinations. In obtaining a license all participating companies will conform to the requirements of the holders of the patent rights. The engineering control program will be supervised by the industrial hygiene engineer already maintained by the association and the medical control program will be supervised by Dr. M. A. Connell, of the Picher hospital. Treatments are available to all eligible employees of participating companies, and voluntary acceptance of the treatment is the right of the eligible employee and not compulsory on the part of the employer. The treatment is also free of any charge or expense on the employee.

In applying treatments, two methods are available: (1) Ball mill and (2) dispersion. The ball-mill method is generally used in therapeutic treatments under direct medical supervision. This method requires from 40 to 60 treatments over a period of time up to one year, depending on the doctor's recommendations for each individual case. The dispersion method is generally used in the prophylactic treatment. This method requires a special room, where the aluminum powder is dispersed into the room air by means of air ejectors having a 100-lb. line pressure, and where the employees secure treatment. The basis for this method is one gram of aluminum powder for each 1,000 cu.ft. of room content, for the 10-minute treatment periods. The employee receives this type of treatment about 10 minutes each day and 200 times over a one-year period. This would require a daily treatment five days each week. An alternative to the dispersion method for prophylaxis treatments would be the ball-mill method used similarly in the therapeutic treatment. These treatments would be, however, of less frequency (20 to 40 times a year and from 1 to 3 minute duration per treatment). The McIntyre Research recommends that this aluminum prophylaxis be administered each workday rather than the less frequent ball-mill method.

★Preparations are being completed by the C.,G.&C. Co. for the sinking of a new shaft on the Potter ranch, half a mile west of the Oak Hill Golf and Country Club, west of Joplin. George W. Potter, of Joplin, owner of the ranch, has had a drill rig prospecting in the immediate vicinity of the shaft site for some time. A comparative shallow run of zinc ore, from 80 to 110 ft. in depth, has been blocked out. Several holes were put down in good ore near the shaft site, and a small pump has been installed. A 4-in. Pomona turbine pump is being installed in another drill



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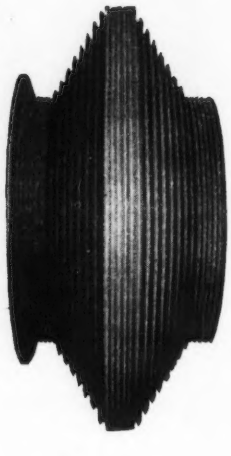

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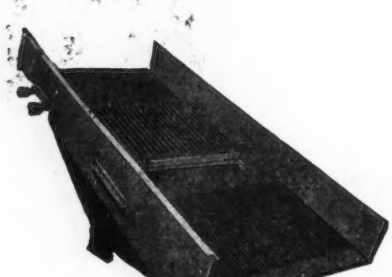

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DANVILLE, ILLINOIS

Tri-State *(continued)*

hole to supplement the other pump. A sinking derrick is being erected, and the shaft will be put down to a depth of about 135 ft. It is planned to sink the shaft 20 or 25 ft. deeper than the orebody, so that the ore can be dragged into an underground hopper, according to A. W. White, of Miami, superintendent of the company. Drilling indicates that the ore lies in a "soft-ground" formation. Associated with Potter in the company's new development are Charles A. Neal and G. C. Niday.

★Blue Bonnet Mining Co., which has been re-treating the old Eagle-Picher Navy Bean tailings over its mill, three miles west of Wentworth, is expanding mine operations on the Owen-Baker lease, according to James F. Haffey, of Joplin, president of the company. The company has completed a new shaft on the lease, and is drifting out into the orebody on the 93-ft. level in a sheet-ground formation. A 6½-ft. face of ore is averaging better than 8 percent in blende recovery. The ore from this shaft is being stockpiled at present, but later it will be trucked to the company's Navy Bean mill, which has a capacity of 50 tons of ore an hour, for treatment. Another shaft on the lease has been put down to a depth of 74 ft. A representative sample of the orebody from the 38½-ft. level to the bottom of the shaft carried 13.33 percent blende and 2.4 percent silicate. With this orebody in a soft-ground, M-bed formation, preparations are being made to remove the overburden and open-pit mine the area. A combination Buckeye 70-B dragline and shovel-loading power unit, with ¾-yd. capacity, together with a D-8 Caterpillar and 12-yd. LaTourneau scoop, will be used in the operations. A third shaft on the lease has been sunk to a depth of 35 ft. and will be continued down to the 105-ft. level to open up a zinc-lead ore deposit. Oscar Told, of Joplin, is superintendent of the company.

★C. & M. Mining Co. has moved a wooden derrick and 450-ton hopper from the Scott lease to the No. 16 shaft on the old St. Louis Smelting & Refining Co.'s No. 4 lease, a mile southwest of Hockerville. The No. 16 shaft is a short distance west of the old St. Louis No. 4 mill shaft, which also is being operated by the company. Mine operations are carried on around the 215-ft. level. The company will continue to truck its ore for custom treatment to the Ballard, or No. 8, mill of the St. Louis company, a mile southwest of Baxter Springs.

★A 2½-yd. dragline has been purchased by Walter A. Martin, of St. Louis, for expanding operations of the Magajupa Mining Co.'s stripping operations on the Crown Point land, east of Duenweg. The Magajupa company, which has been reported to have about 3 percent recovery of lead from the Duenweg open-pit mine at depths from 10 to 15 ft., plans to strip this property eventually to the 150-ft. level.

★A recent milling of 274 tons of ore from the Little Pat Mining Co.'s shallow mine on the Missouri Lead & Zinc Co.'s land, in Joplin, averaged approximately 26 percent in recovery values of zinc and lead, according to B. D. Bensing, superintendent of the St. Louis Mining & Milling Co., which operates a custom mill near Thoms Station, northwest of Joplin, where the ore was treated. Sixty-eight tons of blende and three and one-half tons of lead were recovered from the milling, Bensing reported. The zinc ran nearly 25 percent and the lead more than 1 percent.

★A. G. Swartz, who is conducting an open-pit mine operation on the 76-acre tract of Swartz land, which borders Turkey Creek in the Lone Elm district, last week reported shipments of 87 tons of zinc concentrates recovered from ore from the operations. The blende was recovered from approximately 883 tons of ore.

ARKANSAS

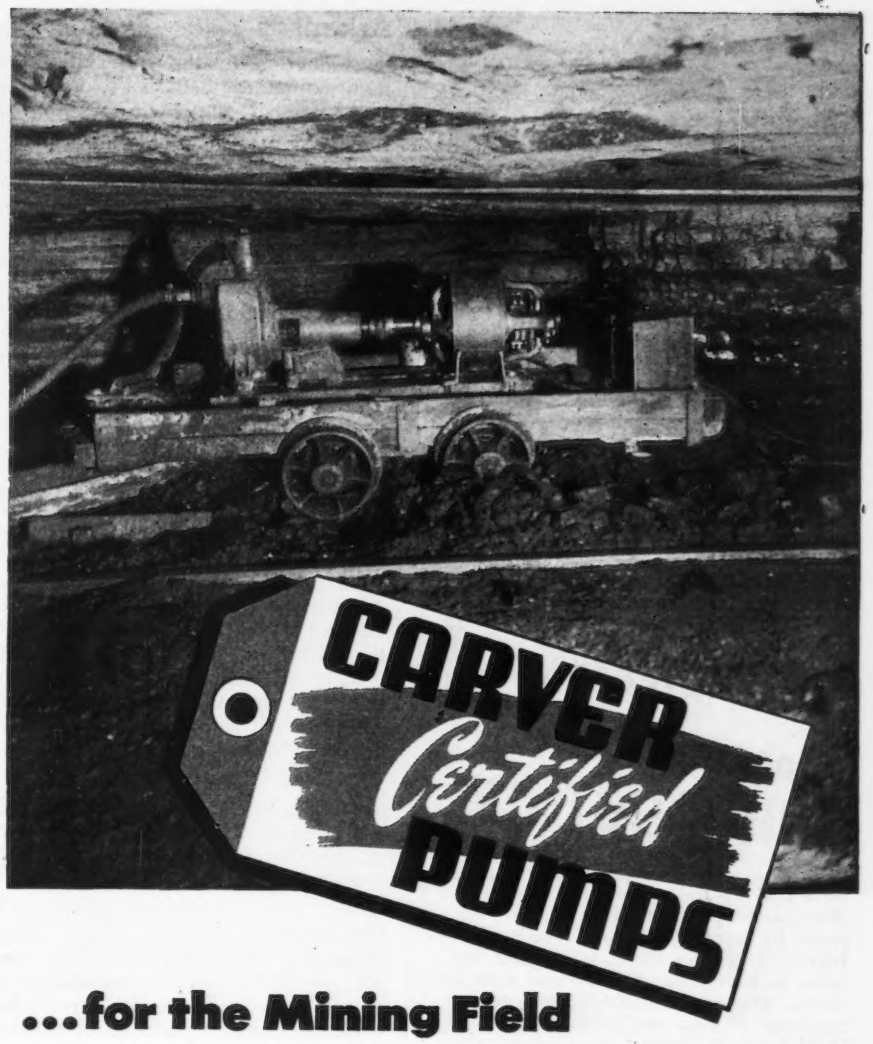
Large tripoli deposit discovered in Ouachita Mountains—Alcoa plants vacated

★The National Geophysical Co., of Dallas, Tex., has filed incorporation papers with the State of Arkansas to conduct surveys, to prospect for, and to devise, develop, and apply geophysics and other methods of prospecting for petroleum, oil shales, natural gas, and other minerals. John W. Newman, of Little Rock, was named resident agent. The company listed property in the State valued at $25,000 and $900,000 outside the State.

★With the recent curtailment of U. S. Bureau of Mines activities throughout the country, the proposed experimental bauxite mine in the Arkansas bauxite district has been abandoned.

★Leo Yount, of Glenwood, Ark., has discovered a large tripoli deposit in the Ouachita Mountains of southwestern Montgomery County. The deposit is more than a half mile long. The semi-vertical beds of tripoli are nearly 200 ft. thick. The tripoli is a result of decomposition of a section of the Arkansas novaculite which is a dominant formation in the area. The material is extremely fine-grained, with silica content of plus 99 percent. A considerable part of the deposit is pure white. Several million tons are estimated to be present. The deposit occurs along the face of a mountain and the overburden has an average thickness of less than 5 ft.

★The Aluminum Company of America has practically completed vacating the Arkansas alumina and aluminum plants which it operated for the Defense Plant Corporation during the war. Most of the 2,000 persons employed have been discharged.



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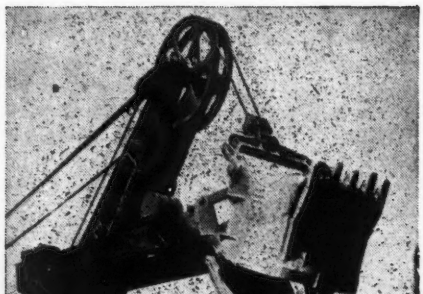

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Arkansas *(continued)*

★Production in the Batesville-Cushman manganese field ran to 1,079 tons in September, of which 656 tons was high grade and 423 tons, low grade. A strong demand exists for low-grade, which is going to the furnaces. High-grade is purchased by the Metals Reserve buying depot at Batesville.

★Individual producers for September were as follows: Arkansas Manganese Co., Cushman, 162 tons high-grade and 313 tons low grade; R. P. Potashick & Co., 400 tons high-grade; Gray Hill and Hawkins properties, operated by Charles Sims, 25 tons high-grade; Walter H. Denison Manganese Co., 69 tons of high-grade and 110 tons low grade.

★R. P. Potashick & Co., which took over the Davis Mining Enterprises mill and leases on Sept. 1, is doing pit mining on the Southern Hill. Operations are in charge of H. E. McBride, and Joe Jellcoat is mill superintendent. New equipment is being installed to increase production of crude. Crude is now being hauled to the mill in six tractors pulling 15-ton trailers.

★Production of high-grade at the Walter H. Denison Manganese Co. is gradually increasing. Most of the high-grade came from the Ozark property in the Pheiffer area. Low grade was produced from mines in the same area.

★The Polk-Southard Mining Co., which took over the Polk-Southard property and the big mill, from Davis Mining Enterprises, is reconditioning the mill to increase its production. Changes include: installation of 30-ft. modern steel logs, and repair of a 3-mile pipe line. Tests on the crude ore which is disseminated in residual clay from the Fernvale limestone show high grade ore, contains over 50 percent manganese. Operations are in charge of R. B. Brown, president. Walter Brown is mill superintendent and R. E. Saunders, secretary-treasurer. It is expected that operations will start about Nov. 1. The company has applied to the State Resources and Development Commission recently for exemption from millage taxes allowed new industries in the State under provisions of a 1938 law.

★S. & G., Inc., which operated the Hurricane mine, in Searcy County near Pindall, produced three carloads of high-grade zinc carbonate concentrates in September Operations are in charge of Tommy Grimmett of Harrison. Jack Marsh is general superintendent.

★W. S. King, of Harrison, who traced the 10 o'clock run in Arkansas, has also traced it from the Missouri line through Boone and Marion counties to White River. He has also discovered the location of two other fissures containing mineralized zones running from the Missouri line into Boone, Marion and Searcy counties. Mr. King and his associates expect to start test drilling on these fissures in Arkansas in the near future.

MISSOURI

Mine development active in Fredricktown district — Central Barite properties are being opened

★All operating companies in the Fredricktown district of southeastern Missouri are doing extensive development work. The four producing companies are the Fredricktown Lead Co., Park City Consolidated Mining Co., St. Louis Smelting & Refining Co., and the Mine LaMotte Corporation. The American Metals Co. is leasing in the Fredricktown area and is conducting magnetic geophysical surveys.

★Several cars of zinc sulphide ore have been shipped from the Alice mine, at West Plains, Mo., to the Central Mill of the Eagle-Picher Mining & Smelting Co. at Cardin, Okla. The Alice mine, which was formerly a producer of zinc carbonate ores by open-pit methods, is under the managership of Earl Doane.

★Nine barite properties are being operated or in the process of being opened in the Central Barite District of Missouri. Campbell Brothers and the Benton County Mining Co. are mining circle deposits in Benton County. The Carver circle deposit of barite, in Morgan County, is being opened by T. M. Carner, of Sedalia. Wemhaner Mining Co. has recently reopened the old Newell No. 1 deposit, in Morgan County. B. N. Walker is mining the Wetherill barite property, in Morgan County, and W. E. Simmers is mining a deposit in Moniteau County. A Texas drill-mud company is mining the Hanenkratt barite deposit, in Camden County. D.F.&H. Co. has reopened the old Boaz property, in Cole County, and L. Sestak is still mining high-grade barite from the Steenberger deposit in Cole County.

MICHIGAN

Calumet & Hecla to make copper chemicals — Bond Falls litigation renewed by State

★Calumet & Hecla Consolidated Copper Co. and Harshaw Chemical Co., of Cleveland, have formed the Lake Chemical Co., organized to manufacture and distribute copper chemicals. The new company, a Michigan corporation, with its principal office in Calumet, Mich., has an authorized capital of $300,000, divided into 3000 shares of common stock of par value of $100 per share. Calumet and Harshaw have each subscribed to 1,500 shares. Calument will supervise the manufacture of the new products, and the sales will be handled by Harshaw.

Officers of the new company are: E. R. Lovell, president; W. J. Harshaw, vice president; D. T. Perry, secretary;

A. D. Nicholas, treasurer. Directors include the officers and A. H. Wohlrab and A. E. Petermann, of Calumet, and C. S. Parke and W. W. Lawson, of Cleveland.

A large section of Calumet & Hecla's Tamarack reclamation plant will be used for the operations of the new company. Equipment is being installed to manufacture copper oxychloride sulphate (a patented copper fungicide) and copper hydroxide. Copper hydroxide is used in making mildew-proofing compounds, insecticides, fungicides, and other products.

★The six-day work week, made necessary by the Government's demand for maximum production of copper during the war, came to an end for employees of the Calumet division of Calumet & Hecla on Sept. 24, and most operations were placed on a five-day week basis. How well Calumet & Hecla performed its job during the war is proved by the fact that twice it won the Army-Navy "E" Award, the highest recognition presented by the Government for civilian war work.

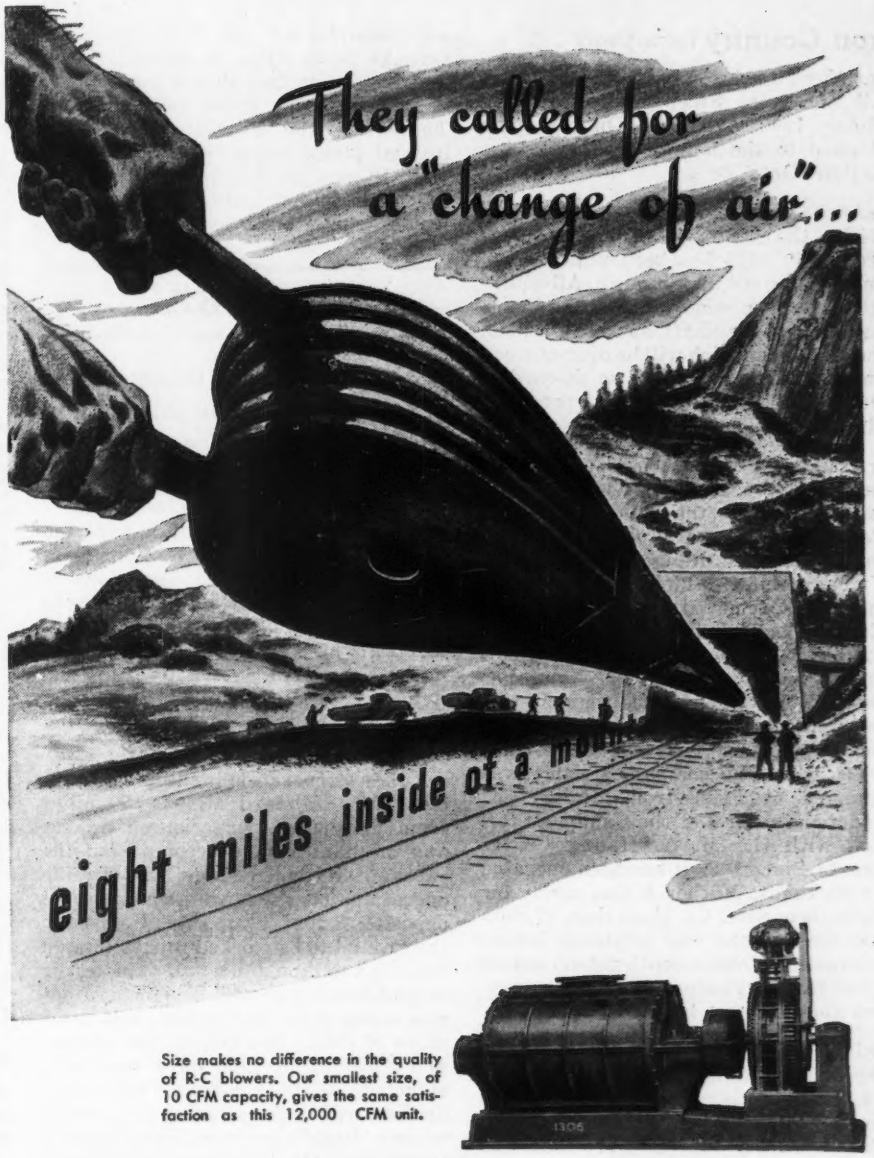
★After nine years of touch-and-go litigation, the so-called Bond Falls case is back in the courts again. John R. Dethmers, Michigan Attorney General, has filed a bill of complaint against the Copper District Power Co., of Ontonagon, a subsidiary of the Copper Range Co., seeking to restrain the operation of the utility's hydro-electric power plant on the Ontonagon River and an order by the court fixing a minimum flowage below the dams now operating. The power company diverts water from the middle branch to the south branch of the river to generate electric energy.

Nine years ago the company began construction of a reservoir above Bond Falls, on the middle branch of the river. A bill of complaint was filed at that time by the State to restrain the completion of the project. The project, however, was completed, and now the State is renewing the litigation, in an effort to protect the beauty of the falls as well as its own water rights. The State Conservation Department owns five quarter-sections between Bonod and Agate falls.

IRON COUNTRY

Holmes mine plant dismantled—Mesabi washing plants shut down by Nov. 1

★Shipments of iron ore from Lake Superior ports as reported by the Lake Superior Iron Ore Association totaled 10,543,099 gross tons for September, compared with 11,329,099 tons for September, 1944. Seasonal shipments totaled 61,671,771 gross tons to Oct. 1, which is 4,231,413 tons less than seasonal shipments to Oct. 1, 1944. Efforts are being made to complete shipments as early as possible so as to avoid the hazardous conditions ex-



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Iron Country *(continued)*

perienced on the Lakes in the late fall. All ore from Steep Rock Iron Ore Mines, Inc., Atikokan, Ont., is now shipped to the new ore dock at Port Arthur, Ont.

★At the Holmes mine, near Ishpeming, Mich., the 220-tons steel shafthouse erected in 1915 has been pulled down and is being cut up for scrap. All equipment has been removed from the shops. As soon as the shaft has been sealed, the watchman's job will be discontinued and the mine classified as discarded. During its life this shaft has produced almost 4,000,000 tons of iron ore.

★Assistance through geological work supported by State funds came too late to prevent the shutdown of the Penn iron mines, at Vulcan, Mich., on the Menominee Range. At the West Vulcan mine all underground equipment was removed in September. At East Vulcan similar work was to be completed in October. This group of mines was opened in 1877 and has shipped every year since then. It was the Menominee Mining Co. that started the work, which was continued until 1882, when the company's name was changed to Penn Iron Mining Co., under the control of the Cambria Steel Co., with the M. A. Hanna Co. as agents. Since 1923 it has been operated by Pickands, Mather & Co., agent for Bethlehem Steel Co. More than 17,000,000 tons of ore was produced before exhaustion, from a depth not exceeding 2,100 ft. The product was a soft gray-red non-bessemer hematite.

★Just east of the Wakefield mine, on the Gogebic Range, the Jones & Laughlin Steel Co. is continuing to explore for an orebody with diamond drills. This work was started more than two years ago. It is under supervision of the Ishpeming office. H. S. Peterson is superintendent.

★Oliver Iron Mining Co. is installing the second of two Peerless 2,000-g.p.m. deep-well pumps at the North Penobscot drainage shaft, together with one 1,000-g.p.m. Layne & Bowler deep-well pump. The company has also ordered some power shovels and cranes, including two ¾-cu.yd. diesel shovels, three ½-cu.yd. diesel shovels, and two 40-ton diesel standard-gage locomotive cranes. This equipment is to be divided between the Hibbing and Virginia districts.

North Carolina Plant Produces Sponge Iron

The recently completed pilot plant built by the U. S. Bureau of Mines at East Spencer, N. C., has started production of sponge iron. Operations are under the direction of E. S. Beebe. The plant was erected on an experimental basis after test drilling sponsored by the State of North Carolina showed the presence of workable quantities of iron ore. Samples of ore were first put through brick kilns at East Spencer and tests indicated that a good grade of sponge iron could be produced. Thereafter the Bureau erected the present plant, which has a capacity of 10 to 12 tons per day, to study processing methods and costs for the conversion of iron ore into sponge iron.

ALASKA

Gold operations are being revived — Yukon Corporation ships equipment to Standard Mines

★U. S. Smelting, Refining & Mining Co. has proved several miles of placer ground on Hog River, and is expected to start dredging soon. William English reports large-scale operations to start soon in the Koyukuk area, near the Arctic Circle. He says development will begin by 1947. On Slate Creek, also in the Far North, Jack Allen and John Repo have been doing drill prospecting, and several others were prospecting in that area this year.

★Yukon Corporation is shipping equipment for Standard Mines, 150 miles from Fairbanks. Experienced miners and mechanics have accompanied the caravan and will engage in hydraulic operations on the large glacier gravel deposits, 3,500 ft. up Mt. Hayes. In the ground to be worked it is estimated there is a million and a half cubic yards of gold-bearing gravel. Standard Mines was active prior to the war, and three miles of ditch, two flumes, two giants, and 3,500 ft. of pipe have been constructed by the company. Additional drilling will be done during the coming winter. Buildings have been reconditioned. In 1941, $32,000 was recovered from the fine gold, for which the Fairbanks bank paid the corporation $32.10 an ounce. C. A. Sherman is engineer in charge.

★Homer Tilley, manager of the Lucky Nell mine, at Hollis, reports that his equipment is ready for operation and he expects to be milling ore in the early spring. He says mining in the district will be active this year.

★Two months of rain encouraged miners in the Ophir district to resume active operations. Nels Vibe, Cole McFarland, Eric Hard, and Joe Degnan are employing small numbers of men on their properties, and the Moss and Larson dredge has been at work during the season. The Grand Creek dredge is closed down.

★Dan C. Byers has again become manager of Livengood Placers, and Ted Loftus, who has been manager, is superintending the Cleary operations of U. S. Smelting, Refining & Mining Co.

★Al Anderson, executive secretary of the Alaska Miners' Association, said in a recent address to that organization that most of the mines in the Fairbanks area probably will be operated more nearly at normal in the coming season. He believes 75 percent of all the properties worked before the war will resume next year.

★The motor ship "Yukon Rose" left the States Sept. 20, bound for Camp Creek, west of Nulato, on the Yukon River, carrying mining machinery, equipment, and supplies for the Camp Creek Mining Co., a partnership composed of G. A. Gustafson, Don Hammond, and Trury Anderson. The supplies include hydraulic pipe, diesel oil, sluices, tractors, and lumber.

★Kelley Adams and Ben Brill, of Yakima, Wash., have closed a deal at Ketchikan for the purchase of the Hope mine, at Hollis, from Jim Matuska. They have brought in a compressor and expect to start operations soon. Mining is expected to be active in that district. Crowe-Swords, president of Santiago Mines Co., of Vancouver, reports that the Valparaiso Jessie claims at Dolomi, Prince of Wales Island, will soon be under development. Attention is being drawn to the "Cracker Jack" owned by the McMicken family, of Seattle. It has been developed by several tunnels and is said to have a strong vein which has been traced for nearly half a mile.

CANADA

Uranium legislation pending — Labor conditions improve — More iron ore discovered in Labrador

★Legislation further to protect uranium supplies from commercial development is pending in the present session of Parliament at Ottawa. Under the War Measures Act, an Order-in-Council was adopted in September 1943. This placed ownership in the Crown of all uranium and radioactive minerals discovered on public lands. Similar action was later taken by various Provinces, but this is held not to affect such radioactive deposits as were held prior to September 1943. Licenses for export of raw materials and finished products were required from Ottawa. Private prospecting has been discouraged in an effort to keep uranium supplies out of unscrupulous hands.

★A marked improvement in labor conditions in Canadian mining camps was beginning to show in October. Mines in Quebec, Ontario, and Manitoba reported adequate crews had been secured for the present, until additional working places could be established. The transition period from minimum production and maintenance was expected to lead steadily to an increased scale of output. In Sudbury, the nickel mines were reported to have reduced their crews by more than 1,000 men, many of whom went into the bush as

prospectors, and they have participated in the widespread activity of staking new claims. Hard Rock and the McLeod-Cockshutt mines have announced plans for resuming production. At various properties there is the prospect of gradually stepping up the rate of output.

★Estimates of high-grade iron ore on the extensive concession of Labrador Mining & Exploration Co. have been increased three times as a result of the field work undertaken this season, according to reports. The broadened picture was the result of new ore discoveries and additions made on both length and width of the orebodies that had been located in previous years. On concessions in Labrador and the adjoining section of New Quebec, the indicated ore is stated to approximate a million tons per vertical foot, according to preliminary estimates. The primary objective of this season's work has been securing detailed information on ore dimensions, as a guide for large-scale development plans. Hollinger and M. A. Hanna Co. are associated in working out the elaborate project required to bring this vast new area under development.

QUEBEC

★Sixty-four percent of world aluminum capacity in 1944 was owned by Aluminum Company of America and its Canadian affiliate, Aluminium, Ltd. Bauxite from rich deposits near Georgetown, British Guiana, are imported to the extensive reduction plant at Arvida, Quebec. The plant is serviced by the world's largest hydro development, on the Shipshaw River, where capacity is rated at 1,200,000 hp. On Sept. 18, the National Syndicate of Aluminum Workers of Arvida and Aluminum Company of Canada signed an agreement that guarantees wartime wage rates for one year, following many months of negotiations. Labor and grievance relations committees were set up. Omitted from the contract were union demands for the check-off, maintenance of membership, and appointment of shop stewards. No change was granted in grievance procedure, in the production bonus in basic wage rates, or in the rehabilitation of war veterans. Alcan insisted that full rights be offered former employees after their discharge from the armed services.

★Jonathan Robinson, Quebec Minister of Mines, on Oct. 10 completed an extended inspection of the northwestern mining areas of the Province. He was accompanied by the deputy minister, A. O. Dufresne, and Eugene Larochelle, secretary of the Western Quebec Mining Association. It was announced that staking this year was expected to include 35,000 mining claims compared with the 20,000 staked in 1944. Extensive development north of the railroad was discussed by the Minister, who expected the completion of the new road to Lake Chibougamau, next year, would open the way

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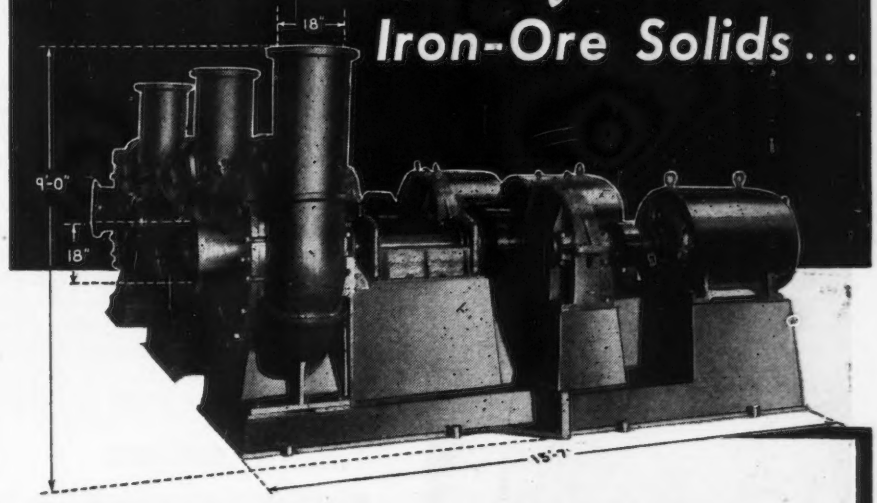

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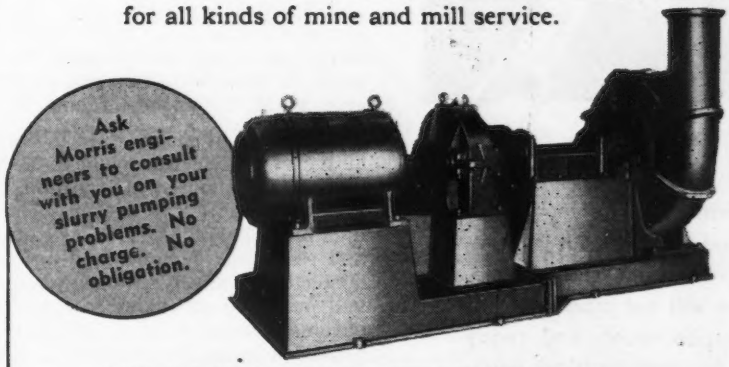

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LUFKIN FOR ACCURACY

Canada *(continued)*

for bringing four new mines into production. Within the next two months it was planned to reopen the Val d'Or School of Mines, with about 100 ex-service men enrolled.

★Promising copper values continued to be intersected on the property of East Sullivan Mines, as diamond drilling advanced along the West orebody, according to an announcement by Pierre Beauchemin, president. The company reported $400,000 in the treasury last May, with more than 20,000 ft. of drilling completed. Recent results were reported to be the best secured to date, exploring the belt of rhyolite along a feldspar porphyry contact. Drill hole No. 22 recently returned 3 percent copper for a core length of 155 ft.

ONTARIO

★Ore shipments this season from Steep Rock Iron Mines to the end of September amounted to more than 350,000 gross tons. In the first week of October, a record shipment amounted to 6,750 tons of ore in one day. The new ore dock at Port Arthur, Ontario, has been placed in use. Output in 1946, after overburden has been removed from the vicinity of the "B" orebody, is expected to be considerably increased. The open pit will continue as a source of production for more than ten years, when underground mining is to be started. Removal of overburden from the "B" orebody will be continued through the winter. It was reported that ore sales in 1944 resulted in income of $90,200, against total preproduction expenses of $6,696,133 and $1,885,515 for buildings, machinery, and equipment. Cyrus S. Eaton is board chairman and Donald M. Hogarth is president. The general manager is M. S. Fotheringham.

★Shipments of magnesium to Sweden and elsewhere in Europe have been reported by Dominion Magnesium, Ltd., Haley, Ontario. The magnesium castings plant is now working at capacity, and peacetime demand is stated to be larger than expected. Foreign markets will purchase output as soon as international trade has been stabilized and provision made for payment in Canadian funds. Substantial stocks of metal at the end of the war made it necessary for the plant to shut down, but plans have been announced for reopening in May 1946. Production cost had been reduced from 39.7¢ a pound in June 1943 to 20¢ in July 1945. Further reduction to 17¢ is stated to be in prospect. Dominion Magnesium holds patent rights to the Pidgeon process in North America, and plans are reported for filing patents in other countries.

★Norman Vincent, president of Mica Company of Canada, reports the formation of a subsidiary, Canadian Anode Products. The new company operates under patents held by Aluminum Company of Canada for the anoding of aluminum products in a wide range of colors. These products are used for structural components by the building trades. The new plant is under the management of Grant Clouse. Mica Company of Canada operates a plant at Hull, Quebec, and has a third interest in a manufacturing plant at Massina, N. Y., for producing a wide range of mica products, varnishes, and ceramics. E. Lachance is general manager.

★J. L. Ramsell, mine manager of McKenzie Red Lake Gold Mines, has reported promising ore disclosures from the extensive development program now in progress. A winze put down from the 1,250-ft. level has led to opening four new levels. The mill is rated at 240 tons a day, gold recovery from March 1935 to the end of 1944 amounting to $8,879,455. Average recovery last year was $9.38 a ton.

★Steady advance in depth development is reported at the property of Aunor Gold Mines (formerly Augite Porcupine). Within recent months, the shaft has been deepened from 2,160 to 2,335 ft. On the 1,875 level, crosscutting to the ore zone has advanced 100 ft. and a distance of 150 ft. remains. Development is in progress on the 1,625-ft. level. An ore length of 1,200 ft. has been opened at the 1,500-ft. horizon, the deepest point where the ore is fully developed, showing average grade of $12.70 a ton, compared with last year's average mill recovery of $14.07. The mine manager, Stanley S. Saxton, reports operating costs at $7.46 a ton. Ore reserves are estimated at a four-year supply for the 475-ton mill. The property is controlled by Noranda Mines.

MANITOBA

★Sherritt Gordon Mines, Ltd., reports that tonnage milled in the second quarter of 1945 shows a reduction from that of the first quarter of 1945 and the corresponding quarter of 1944. During the quarter ended June 30, 1945, the mill operated 62 days, treating 165,786 tons of ore, producing 6,262,433 lb. of copper and 5,654 tons of zinc concentrate. This reduction in tonnage was due to the shortage of underground labor, which also forced the suspension of practically all development work for the period under review. Two prospecting parties are being maintained in the Granville Lake area.

★Gunnar Gold Mines, Ltd., has sold equipment to Ogama-Rockland Gold Mines, which will permit mining operations to be carried to a depth of 500 ft. Gunnar controls Ogama-Rockland, and, prior to cessation of operations at the parent mill, treated 4,121 tons of Ogama ore with an average recovery of 0.91 oz. per ton. Operations at Ogama-Rockland will be forced to await the transportation of supplies by winter haulage.

★For the six months ended June 30 last, Hudson Bay Mining & Smelting Co., Ltd., treated 895,578 tons of ore,

or slightly less than a daily average of 5,000 tons, compared to the peak average of 6,150 tons per day in 1943. Estimated net earning for the period is $2,534,871 after allowance for taxes and write-offs.

Hudson Bay, in announcing awards to two graduates of Flin Flon high schools, made known that the company has established two scholarships, tenable at the University of Saskatchewan and the University of Manitoba. The two scholarships are for a period of four years, with an annual award of $500. The recipients must select courses related to the chemical, geological, mining, and metallurgical sciences. The final two years may be taken at Eastern universities.

★Preliminary exploration on the property of Camwe Snow Lake Mines, Ltd., has been started by American Smelting & Refining Co. G. Driom is in charge of operations.

★Sannorm Mines, Ltd., has completed the geophysical survey of its property in the Rice Lake district, and has commenced its 20,000 ft. diamond-drilling program. Intersections include 0.11 oz. across 5 ft., 0.73 oz. across 2 ft., and 0.18 oz. across 15 ft.

★Hollinger Consolidated Gold Mines, Ltd., are reported to be taking over the property of Snow Lake Gold Mines, Ltd., adjoining the Nor-Acme property of Howe Sound Exploration Co., Ltd.

★Additional sampling of the Valley vein on Kiwago Gold Mines, Ltd. property in the Rice Lake district has extended the oreshoot a further 75 ft., according to A. J. McLaren, in charge of operations. Surface sampling to date shows an average grade of 0.96 oz. uncut across an average width of 27 in. for a length of 175 ft.

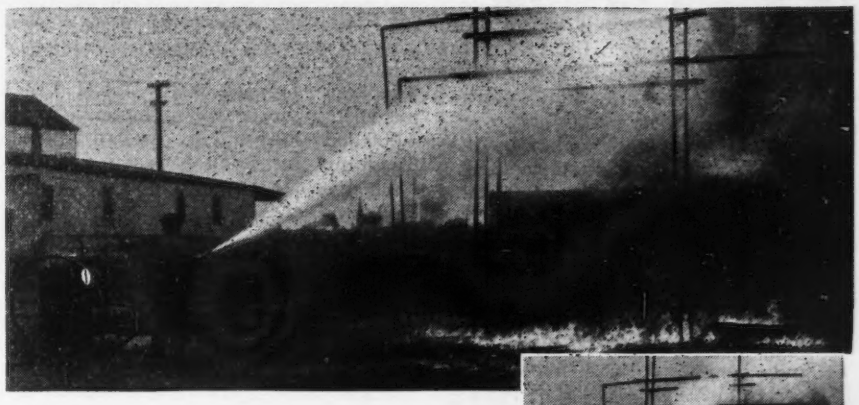
★R. J. Jowsey, president of Wekusko Consolidated Mines, Ltd., reports that 15,000 ft. of diamond drilling has been completed in a program which will probably entail 75,000 ft. on the Squall Lake property. Drill intersections indicate two ore sections averaging better than 0.20 oz. over 4.5 ft. for 400 and 900 ft. respectively. A 5-ton pilot plant is being taken to the property, to ascertain what may be expected from milling. A survey of electrical power sources is now under way.

BRITISH COLUMBIA

★Silbak Premier Mines, Ltd., Portland Canal mining division, received net smelter returns of $43,577 from August production, recovered after treatment of 5,173 tons, averaging 0.21 oz. gold and 1.61 oz. silver per ton.

★Marble Bay Mining Co., Ltd., has been formed with a capital of 3,000,000 shares of $1 par value, of which 1,160,000 shares have been issued for ten claims or fractions plus an assignment to purchase nine other claims or fractions on Texada island, Nanaimo mining division. The new company will provide $300,000, with which it is hoped to bring the Marble Bay mine into pro-

BROKEN OVERHEAD GASOLINE LINE FIRE KNOCKED OUT IN SIXTY-FIVE SECONDS



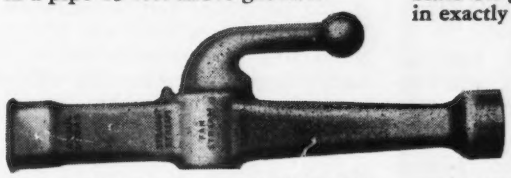
NEW DUAL-STREAM NOZZLE

Further increases fire-fighting effectiveness of

DUGAS EXTINGUISHERS

Pictured above is a rigorous test conducted at the DUGAS Division Test Grounds, under observation of Underwriters' Laboratories and Factory Mutual Laboratories. Burning gasoline escaped at the rate of 10 gallons per minute under 50-lb. pressure through three hacksaw cuts in a pipe 13 feet above ground.

Inset shows how quickly the fire was knocked out by DUGAS Dry Chemical after it had been allowed to burn for one full minute. Using the straight stream from the new dual-stream nozzle on a No. 350-A DUGAS Wheeled Extinguisher, the overhead gasoline fire, including blaze on ground, was extinguished in exactly 65 seconds.



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3—Non-toxic, non-corrosive, non-abrasive.
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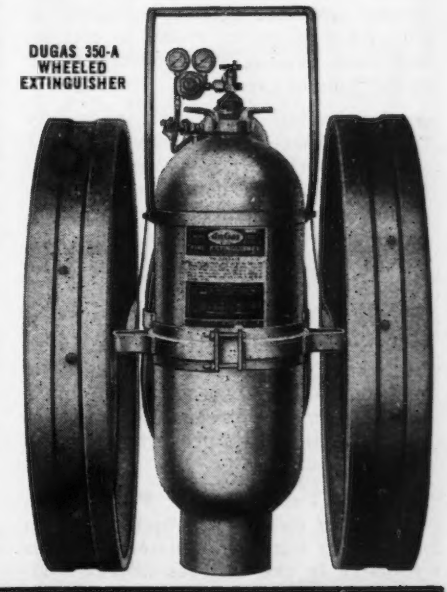

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Canada *(continued)*

duction. First stage in exploration will consist of diamond drilling. It is planned to use two drills, one on the surface and one from the 5 level of the old mine, the lowest point dewatered to date. Dr. Victor Dolmage is consulting geologist, R. H. Stewart, consulting engineer, and George R. Griffith, mine manager.

★Work has been commenced on the crosscut from the bottom of the Little Billie shaft to reach the Prosser orebody on the property of Vananda Mining Co., Ltd., Texada Island. The Vananda company, a subsidiary of Pioneer Gold Mines of B. C., Ltd., expects to reach the orebody at a length of 350 ft.

★Santiago Mines, Ltd., has let a contract for the drilling of the Storneway group of 16 mineral claims, situated southeast of the holdings of Vananda Mining Co., Ltd., and Marble Bay Mining Co., Ltd., on Texada island.

★The tunnel into the Ural claim of Bridge River Consolidated Mines, Ltd., has penetrated the serpentine diorite contact. The face will be advanced at least 300 ft. before drifting, parallel to the contact, is commenced. Diamond-drill stations will be established at 200-ft. intervals and holes will be driven downwards to intersect any veins which may terminate in the contact.

★September production of Cariboo Gold Quartz Mining Co., Ltd., was 724 oz. gold, valued at $27,874, from 21,222 tons of ore treated.

★September production of Island Mountain Mines Co., Ltd., was 967 oz. gold, valued at $35,621, from 2,100 tons, averaging 0.46 oz. gold per ton.

★During the calendar year 1944, Kelowna Exploration Co., Ltd., Osoyoos mining division, produced 32,526 oz. gold, 2,270 oz. silver, 90,593 lb. copper, and some arsenic after treatment of 88,491 tons of ore.

★After having obtained all ore to date from the Wheeler group by means of surface work, Hedley Mascot Gold Mines, Ltd., has commenced underground development by driving a tunnel from the bottom of the glory hole. Ore is trucked to the Canty bunkers, whence it is trammed to the Mascot mill.

★Hedley Amalgamated Gold Mines, Ltd., has been granted permission to sell 460,000 treasury shares to obtain funds to finance proposed initial diamond drilling of its property on Stemwinder mountain.

★Hedley Yuniman Gold Fields, Ltd., is drifting on a vein which has been marked by high-grade outcrops on its property in the Osoyoos mining division. J. W. Gallagher, president and managing director, states the work will include frequent crosscuts to a parallel vein close by for the purpose of testing the latter. Diamond-drill stations will be established underground and year-round work undertaken from these vantage points. Dr. Victor Dolmage is consulting geologist in charge.

★Hedley Monarch Gold Mines, Ltd., has been incorporated with a capital of 3,000,000 shares. The company holds 31 claims, including 5 Crown-granted claims previously developed by Gold Valley Mines, Ltd., in the Osoyoos mining division.

★Yukon Consolidated Gold Corporation will operate seven or eight dredges in the Dawson area next season, according to Arnold M. Nordale, mining engineer with the company. Three dredges were operated this season by the company. Stripping and other preparatory work will start early in the spring.

MEXICO

Operators expect little benefit from silver price increase — Government to subsidize exploration

★Mexico's mining picture has been drastically changed by two events, the raising by the U. S. of the ceiling price of foreign silver to a parity with that of the domestic, and cancellation by Metals Reserve of contracts with various mining enterprises in Mexico. Both happenings have made a big difference in Mexican mining and have prompted mixed optimism and pessimism.

Government reaction to the hike in the silver price, as voiced by Finance Secretary Eduardo Suarez, was bullish, with predictions of universal benefit to economic conditions in the Republic. That sentiment was seconded by the national miners' union, which announced that it is campaigning for an immediate pay hike for its members, some 100,000, in mining and allied industries. The union contends that as mining employers are in line for increased revenue, it is only fair that their employees get more pay. It asserted that it will brook no hesitancy, delays, or quibblings on the part of mining employers about putting through the demanded wage increase, the amount of which it does not specify, but which, it says, must be just and adequate. Only a veiled threat of a strike was made by the union in this announcement. There is a general opinion that the higer silver price will be of little benefit to operators after the government and labor have exacted their tolls.

★The vital importance of uranium and allied minerals essential to the atomic bomb has prompted a presidential decree ordering strict Government control. Mexico has a known uranium deposit at Placer de Guadalupe, Chihuahua, and good indications of others in Durango and Guerrero. The National Commission for Stimulation of the Mining Industry is sifting reports of the discovery of a uranium deposit in San Ignacio municipality, Sinaloa, by Alfredo Padilla, geologist, of western Mexico. San Ignacio is the scene of the sensational gold flurry of 14 years ago. Considerable mining is still done there.

★The Cia. Minerales de Chihuahua, S.A., El Potosi affiliate, has been promised tax rebates of 700,000 dollars to compensate it for building a 112-kilometer road from Creel, the railhead, to its new El Carmen copper-gold mine on the Batopila river. Granting this subsidy is part of the federal Government's program for road building and reconstruction in mining regions.

★Operations of the San Rafael mining cooperative, Pachuca, Hidalgo, one of the first-established Mexican enterprises of the kind, have been disrupted by cave-ins in its Trompollis shaft, said to have resulted from careless blasting. Reports are that the cave-ins endangered the lives of 400 miners on shift at the time, and that the closure has made some 800 miners jobless. It is also said that the disaster has prevented the society from meeting its weekly payroll, as its financial condition is poor. The Labor Ministry is investigating the case.

★Pleas of large numbers of cooperative miners of Hidalgo and Guanajuato for federal Government loans to enable their organizations to weather bad economic times have been submitted to the Ministry of Finance by President Avila Camacho. The miners sent delegations to interview the Chief Executive at Mexico City. They told of difficulties confronting their organizations and said that unless Government cash aid is forthcoming their enterprises must quit. The delegations told the President that only Government relief can help their societies, because the banks and other credit institutions refuse to lend them financial aid.

The delegates represented the San Rafael cooperative, and the workers, some 250, who have taken over the mine in Guanajuato that was operated by the Cia. Minera Guadalupe, S.A. The San Rafael men seek a 130,000-peso ($26,550) loan and those of Guanajuato, an 80,000-peso grant.

★Installation of a 20-ton flotation plant on its gold and silver properties at Mina Maclovia, near Guzapares, Chihuahua, is so well advanced that the Cia. Minera del Oro Azteca, S.A., expects to have it in service before the end of November. At present, ore is being obtained only from development faces, but diamond drilling at a depth is expected to give good results. The works are being directed by W. S. Worley, the general superintendent, of Chihuahua City. John Henry Pope also of Chihuahua City, is the president of the company.

★President Avila Camacho has ordered the Ministry of Finance to subsidize exploring and prospecting for deposits

of metals and minerals that enjoy a ready market at home and abroad. This subsidizing is to be from a fund the ministry will build up from proceeds of the special excise tax on silver exports. Information is that the Government was alarmed by the warning given by representatives in Mexico of the U. S. Metals Research that they had ascertained from a long and careful examination of mining prospects in this country that unless adequate reserves are obtained ore will soon be exhausted. It was said that as most mines have extracted only the highest grade ore during the past several years, because that was most profitable, these bodies will soon be played out. It is expected that the Government will modify its mining tax system so as to encourage the working of low-grade deposits.

★Various developments are in progress by the American-backed Cia. Minera El Palero, S.A., in the Guanacevi district, Durango, which is employing a small staff in the mine and the mill, under the direction of Harold McLeod, president and general manager. Work features removing fill from old stopes. The enterprise is currently treating at its 50-ton gravity concentration-flotation plant about 36 tons daily of the gold, silver, lead, copper, and zinc ore it is mining at two workings. These two workings are connected by a tunnel.

★An important deposit of celestite is being developed near Chihuahua, Chihuahua, by the Fomento Industrial Chihuahuense, S.A., E. J. Ryan, manager, and M. Krakauser, assistant manager, which has its headquarters at Edificio Victoria, suite 501-04, Chihuahua. This enterprise recently assumed charge of properties of the Cia. Minera Buenaventura, S.A., and is supplying that company's customs smelters with fluxes and diluents. The fomento also does import and export business and renders industrial research and engineering services for the industry.

CHILE

Copper-mining companies permitted to close down—Nation concerned about synthetic nitrate competition

★On Sept. 30 the contract for the purchase of all local ores and concentrates which had been in operation since Pearl Harbor between the U. S. and Chilean Government terminated. As the latter nation has not felt justified in giving a bonus payment to the small miners, so that they may continue to produce under prevailing high costs brought about by a serious inflation, the management of all medium producers, sought permission from the Labor Ministry to close down their mines and discharge employed labor. Until recently, the Secretary for Labor had refused to give such permission, which a recent law required before more than ten workers could be discharged together. However, it became necessary to concede the Chilean copper mining companies such permission, and the Under Secretary for Labor notified the managers of all such enterprises that such authorization would be granted, to go into effect Sept. 30. It was also announced that the Government had taken measures to insure workers immediate work in the nitrate Shanks plants that are being prepared in the provinces of Tarapacá and Antofagasta to increase Chilean production of nitrogen fertilizer.

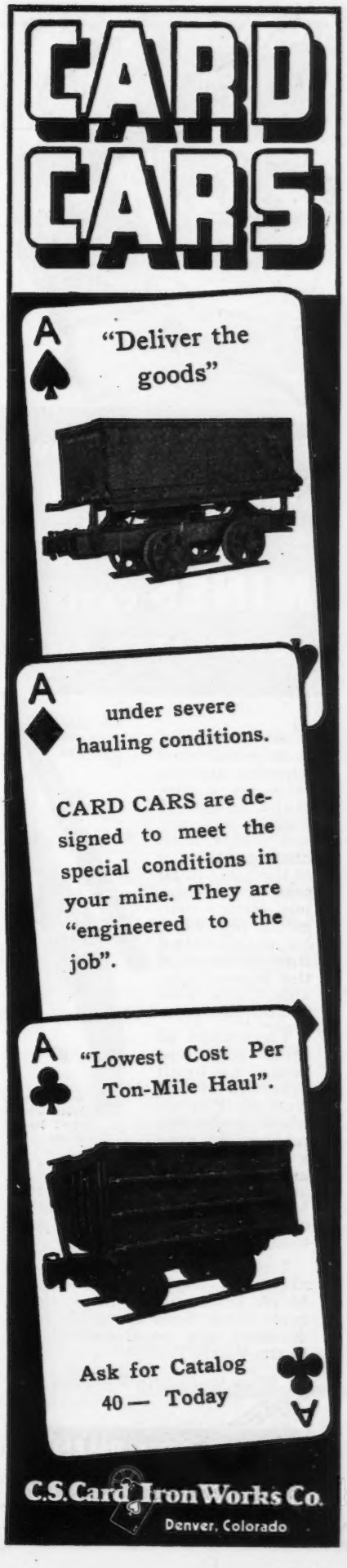
★For more than a month the men employed at the Patagua mine and mill belonging to Sali Hochschild, and situated in the Aconcagua province, have been on strike demanding higher wages because of increased cost of living. Management argued that the cost of production has also increased because of higher costs of supplies and freight, while the price received for the copper concentrate has decreased 20 percent during the present year. After much discussion, the men accepted the owner's view and decided to go back to work under the same conditions that prevailed before the strike. This mine was among those to be shut down after Sept. 30.

★The end of the war brought up a series of problems affecting the Chilean nitrate industry, in which considerable American capital is invested. Such problems have been an important topic in Congress and in the local press lately.

Chilean opinion is concerned about the important German and Japanese synthetic nitrogen fertilizer industries, both of which are of world importance. As nitrogen compounds are important as fertilizers and as explosive ingredients, the retention or dismantling of this industry in Germany and Japan come within the Postdam agreements. A possibility is that at least some of the German synthetic plants may be moved to Russia as part payment for the havoc brought about by the Nazi armed forces in that country.

Another important question, yet unanswered, is what the U. S. Government intends to do with the nine large new synthetic nitrogen plants it built during the present war at a cost of $200,000,000 and which were delivering about half the American production of nitrogen during the war.

According to local experts, the Chilean nitrate industry is in a position to compete with the privately owned synthetic nitrogen fertilizer industry under normal conditions of trade, but it will not be able to do so if it has to fight against tariffs and Government subsidized production, or if the new plants are rented to private interests at very low rates, such as was the situation in Germany during the last war, for under such conditions amortization and interest of the capital invested will be practically nil. The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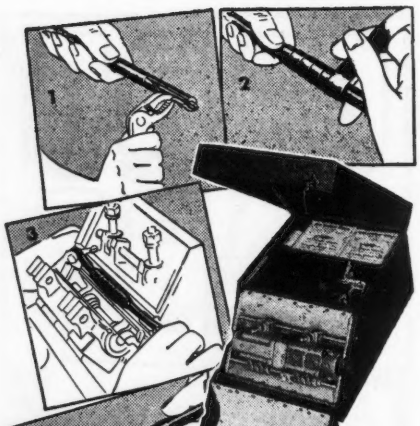

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Chile *(continued)*

large development of the synthetic nitrogen industry since the beginning of the first World War, an expansion mainly for defense purposes and therefore without regard to cost in most countries, has reduced Chile's quota in the world's nitrogen requirements from about 80 percent 35 years ago to less than 8 percent at present.

AFRICA

Transvaal producers grant payments to servicemen — Gold production increases in July

☆The Gold Producers' Committee of the Transvaal Chamber of Mines will make special concessions, in the way of grants and gratuities, to employees of the gold mining industry who enlisted for active service without the permission of their mine managements. The concessions cover all bona-fide mine employees who, before the conclusion of hostilities in Europe, left the mines to join the fighting forces. The payments, which will be made to men returning to the industry for a stipulated period on their discharge from the services, comprise: A special grant of £30; a war gratuity calculated at the rate of £30 for each year of military service; and the payment of arrear contributions to the Witwatersrand Gold Mines Employees' Provident Fund amounting to £1. 6s. per month in respect of each man, thus protecting in full his rights and interest in that fund. It is provisionally estimated that these concessions will cost the industry approximately £400,000.

The operations of the gold mines had to be continued during the war in the interests of the national economy. In order to maintain gold production as far as possible, the Government decided that all employees of the industry should get the permission of their mine managements before enlisting for active service. Under this arrangement more than 6,500 men—representing one man in approximately every six employed by the industry—joined up with the permission of their employers and received specified allowances. More than £6 million has already been paid by the industry in allowances, grants and gratuities to men who joined up with permission. These will be continued until the men are demobilized. In addition to men who volunteered with permission, however, there were approximately 3,000 men who, failing to get permission, resigned to go on full-time military service. Though the actions of such men could not be condoned so long as hostilities continued, as their action might have had the ultimate effect of bringing gold production to a standstill, the Gold Producers' Committee, nevertheless, viewed their position with understanding.

★Special courses for the intensive training of ex-servicemen who wish to take up mining have been instituted at the Government Miners' Training Schools. Forty-two men have already completed this course and have been placed in employment on the gold mines. There are at present 38 men taking the course.

★It is also announced that the Gold Producers Committee of the Transvaal Chamber of Mines has initiated a scheme under which paid leave will be granted to ex-service employees of the industry to enable them to take advantage of special educational courses at approved institutions. These privileges will be available to all ex-servicemen other than apprentices, who return to the industry with at least six months' full-time military service to their credit, whether enlistment was with or without permission. The industry will grant leave, and pay in full salaries, wages, and allowances during such periods of leave, to men qualifying under the scheme who may wish to further their studies in any direction. Witwatersrand Technical College will provide the necessary instruction, and special courses have been arranged in mining, metallurgy, mechanical and electrical engineering, assaying, secretarial work, and accountancy. Courses can also be taken in other subjects at other educational institutions.

★It is reported that an agreement has been entered into between the Johannesburg Consolidated Investment Co., Ltd., Randfontein Estates G.M. Co., Ltd., New Union Goldfields, Ltd., Middlevlei Estate and G.M. Co., Ltd. and Edinburg Investment Co., Ltd. (subject to ratification by shareholders in the case of the latter two companies), in terms of which a prospecting program will be carried out by the Johannesburg Consolidated Investment Co. on the Farm Middelvlei No. 6, District Krugersdorp.

★Re-estimates of the ore reserves of companies of the Central Mining-Rand Mines group, whose financial year ends on June 30, are:

Consolidated Main Reef—Available 6,254,000 tons, averaging 3.6 dwt. over 56.5 in.; additional in shaft and safety pillars not at present available for stoping, 1,140,000 tons, average value 4.1 dwt.

Modder East—Available 5,892,000 tons averaging 3.4 dwts. over 43.5 in. Pillars 496,000 tons, averaging 3.9 dwt.

New Modder—Available 1,184,000 tons, averaging 2.9 dwt. over 44.5 in. Pillars 191,000 tons, averaging 3.6 dwt.

Nourse Mines—Available 2,311,000 tons, averaging 4.4 dwt. over 46.5 in. Pillars 322,000 tons, averaging 4.2 dwt.

★New Consolidated Gold Fields have announced the recalculation of ore reserves in mining companies under their control as at June 30, as follows:

Luipaards Vlei—Available 2,742,000 tons averaging 4.8 dwt. over a stoping width of 47.4 in.

Sub Nigel—Available 2,912,000 tons averaging 11.5 dwt. over a stoping width of 35.8 in.

Venterspost — Available 2,070,000 ton averaging 5.2 dwt. over a stoping width of 68.8 in.

☆General Mining state that the ore reserve of Van Ryn Gold Mines Estates has been recalculated, at 30th June, to be 228,000 tons averaging 2.3 dwt. over a stoping width of 32 inches.

☆Total production of metals and minerals for Southern Rhodesia for June 1945 consisted of: gold, 46,998.04 oz., valued at £404,771; silver, 7,772.5 oz., valued at £761; and base metals and minerals valued at £266,170. Total value of production was £671,702, compared with £687,286 for May 1945. Gold was valued at 172/3 per ounce.

★With credit for the full value of the increased price of gold, together with the repeal of the old premium tax, the results given of the operations of three Rhodesian gold mines for the quarter ended June 30 last are illuminating:

Cam and Motor: Tons milled were 75,600 at a working cost of 18s. 6d. per ton. Total profit was £61,542. Due to the increase in the gold price, the working profit for the six months ended June 30 is estimated at £128,055.

Sherwood Starr: Tons milled were 26,700 at a working cost of 18s. 6d. per ton. Total working loss was £1,490, but on account of the increased price of gold, it is estimated that there will be a working profit of £1,031 for the first six months of this year.

Rezende Mines: Tons milled were 56,700 at a working cost of 19s. 4d. Total profit was £12,014, but it is estimated that on the revised basis the estimated profit for the first half of this year will be £26,211.

★The latest news from Sub Nigel mentions that during the last quarter, 960 ft. of development, all of it unpayable, was done on the Kimberley reef. Sinking of the first of the three boreholes to test the potentialities of the Kimberley reef was continued. Borehole SN3 was advanced 1,003 ft. to a final depth of 4,716 ft. The May reef of the Kimberley series was not identified in the borehole, which was probably due to the dike encountered between 4,032 and 4,334 ft.

☆On Vogelstruisbult, the elliptical shaft had reached a depth of 704 ft., 339 ft. being sunk during the second quarter of this year. During the same period, the joint Sub Nigel-Vlakfontein shaft was advanced 641 ft. to a total depth of 1,524 ft. This is also an elliptical shaft. The joint ore shaft being sunk by Springs Mines and West Springs has now reached a depth 2,044 ft., of which 333 ft. were advanced during the June quarter.

★Both the Witwatersrand and other districts improved in July on the June figures of gold production. The Witwatersrand return shows an increase of 7,447 oz. to 1,009,518, representing an advance in value (with the returns for the two months on the same basis of

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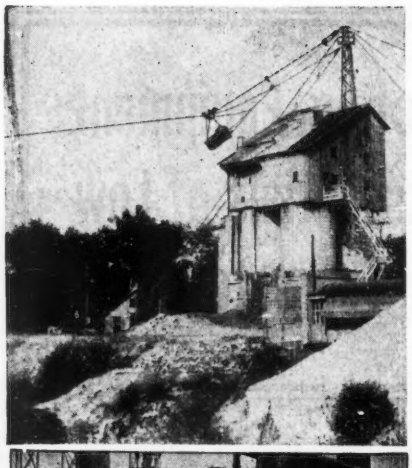

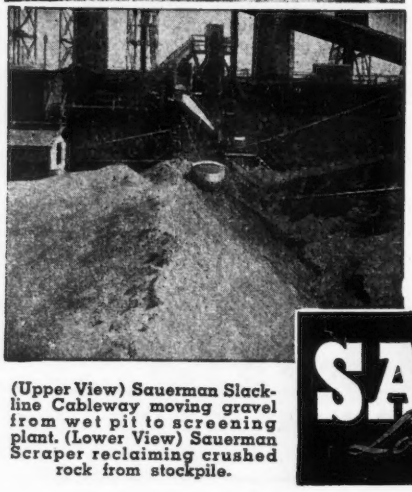

(Upper View) Sauerman Slackline Cableway moving gravel from wet pit to screening plant. (Lower View) Sauerman Scraper reclaiming crushed rock from stockpile.

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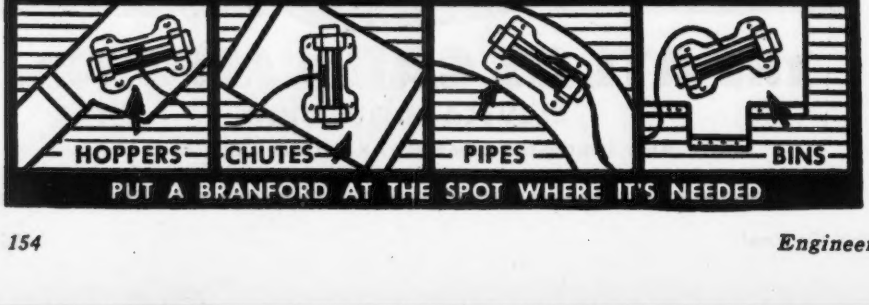

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Africa *(continued)*

172s. 3d. an ounce) of £64,138, to £8,694,474. The return from the outside districts improved by 474 oz. to 23,199, and the value by £4,082 to £199,801. In the aggregate, therefore, Transvaal output, according to the return of the Chamber of Mines, increased in July by 7,921 oz., to 1,032,717, and the value by £68,220 to £8,894,275.

Most of the Witwatersrand producers showed improvements, the principal increases being: West Rand Cons., 1,562 oz.; Durban Deep, 1,250; Simmer & Jack, 856; Crown Mines, 828; Venterspost, 700; E. R. P. M., 585; Nourse Mines, 557; and Government Areas 542. The main decreases were: Rand Leases, 1,078 oz.; Langlaagte, 825; Grootvlei, 688; and East Geduld, 671. The native labor position on the gold mines shows a further decrease of 2,708 employees. The present total employed is 303,686.

★The total quantity of rough and uncut diamonds produced in the Transvaal during June 1945 was 2,198.95 carats, valued at £10,321. This is equal to £4.13.10d. a carat.

AUSTRALIA

Western Australia and Victoria gold production summarized — Queensland operates tin mill

WESTERN AUSTRALIA

★There is possibility of a postwar renewal of activity in the Coolgardie district, though whether the activity will go beyond systematic prospecting to actual production will be uncertain for some time. Coolgardie was Western Australia's first great gold field, preceding the discovery of Kalgoorlie by a year. At the beginning of the 1930's the field was practically dormant, and though its mines were actively prospected during the years following the gold revival, only two of the old mines have been re-established, and only one new mine has been brought into production. In recent months, however, two of the largest organizations in the State have taken up a large concession to the northwest of the town, and will explore it jointly as soon as the position with regard to labor permits. Another Kalgoorlie company is diamond drilling a prospecting area of 300 acres to the north, which will add to the interest of the Kintore district, where the Western Mining Corporation took up the Callion mine, just prior to the war, but has had to suspend operations due to wartime conditions. This property contains a promising oreshoot.

The chief center of activity is at Hampton Plains, at a locality more than five miles to the south of Coolgardie. Prospecting at the Surprise

Gold Production in Western Australia

Year	Ore Treated Tons	Yield Gold, Oz.	Yield Per Ton, Dwt.	Men Employed	Dividends £A Paid,
1940	4,292,000	1,155,000	5.38	14,368	1,060,000
1941	4,211,000	1,105,000	5.25	12,929	830,000
1942	3,226,000	846,000	5.24	8,033	424,000
1943	2,051,000	532,000	5.18	5,048	630,000
1944	1,777,000	473,000	5.31	4,584	815,000

Gold Production in Victoria

Year	Gold Yield, Oz.	Value of Production, £A	Dividends Paid, £A
1940	180,567	1,942,200	566,760
1941	149,769	1,600,500	444,560
1942	101,497	1,060,900	302,020
1943	56,511	590,500	195,075
1944	54,086	568,000	229,875

mine has been in progress for about two years, and consistent returns, approximating 10 dwt. gold per ton, have been obtained from the treatment of the ore at the Coolgardie State battery. A number of leases have been taken up recently and an option has been taken by a strong financial group, which is now carrying out diamond drilling. Although results are not available, they seem to be such as to stimulate activity.

The last return from the treatment of ore from the Surprise lease, at the State battery, gave 215 oz. of gold from 336 tons of ore. Tailings usually assay 5 to 7 dwt. gold per ton. In the same area, a further find is being opened up, and the milling of 400 tons of ore obtained in prospecting has induced a company recently operating on the Yilgarn gold field to take an option over the leases. These discoveries and results have led to the taking up of 49 leases in the Hampton Plains country. The formations with which gold is associated are the typical quartz-dolerite-greenstones which are characteristic of the great part of the auriferous areas of Western Australia.

★A conference has recently been held at Kalgoorlie between the State Minister for Mines and representatives of the Chamber of Mines of Western Australia, the mining unions, and the local governing bodies, at which general concern was expressed for the necessity of preparing a plan for rehabilitation of men returning from the services to the gold-mining industry. The necessity for further development of ore reserves, and for preparatory work to make new ore available for stoping is urgent. It was decided to place the matter before the Prime Minister, and ascertain what priority might be allotted to gold mining. With the growing clamor for labor, and the urgent call for housing which is likely to have a very strong political bearing, it is probable that mining generally will receive little consideration, despite the large releases of manpower that may be made.

★Influence of the war on the decline of the Western Australian gold mining industry is shown in the accompanying table.

Most of the large mines have been reduced to one-shift operation; development has been either suspended or largely curtailed, and the decrease in development expenditure is probably responsible for the increase in dividends over the past two years, although revenue is substantially less owing to lower output. Of 60 mines affiliated with the Chamber of Mines, 25 are now closed down and are on a maintenance basis. Of the 4,584 men recorded as employed in 1944, about 1,500 are employed in mines which have been declared protected undertakings by the Commonwealth Government by reason of the production by them of pyrite, tungsten, and arsenic, so that the labor position of gold mining is worse than the figures indicate.

VICTORIA

Somewhat similar figures to those given for Western Australia can be given for Victoria. Prior to the war, there were about 80 moderate to small mines operating — none of the State's mines can be called large, except two of the dredging undertakings. Included in the number were nearly 20 enterprises cyaniding tailings dumps, and which were important as gold producers and employers of labor. Now 12 mines are operating, all on a reduced scale. Production of gold mining over the five war years is shown herewith.

Of 19 leading producers which paid dividends in 1941, eight made distributions in 1944, in which year one mine contributed nearly half, with £A103,500. In the first six months of 1945, the gold yield has increased by 2,267 oz. on the production for the corresponding period of 1944, the total for this year being 26,805 oz., valued at £A284,910. The month of June, however, was below the previous June, the output being 5,112 oz., a decrease of 1,194 oz.

QUEENSLAND

Much of the tin production in North Queensland is in the hands of small producers whose mines might not warrant the erection of a mill. Such small plants are deficient in classification and concentration appliances, and in fine crushing and grinding generally use the stamp battery for the sake of simplicity and cheapness with the resultant high slime production and low recovery. The State Government, with the object of meeting these difficulties, operates a treatment plant at Irvinebank, which is among the most efficient tin mills in Australia. As well as tin ores, occasional lots of wolfram, scheelite, antimony, manganese and bismuth ores are treated. As many large and small con-

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Australia (*continued*)

signments from numerous producers must be treated, bin space is important and provision is made for lots varying in size from five tons to several hundred tons, the total bin capacity of the plant being 1,200 tons in bins from 20 tons to 150 tons in size.

Ores vary in grade from 0.4 percent tin oxide to as high as 35 percent for occasional small parcels. In the reconstruction of the mill, a number of years ago, the stamp battery then used was relegated to the position of an intermediate crusher between rock breaker and rod mill, being fitted with a screen having ¼-in. openings. The product forms feed for the 2 by 3-ft. rod mill. The rod mill was preferred because of the rolling and cracking action, using wavetype liners, and the low discharge, thus reducing the risk of overgrinding and slime production. Rod-mill discharge is delivered onto a screen and the oversize returned to the mill. Close hydraulic classification is practiced and all table middlings are reground in a 4x2-ft. rod mill, the product from both large and small mills being minus-90 mesh. Wilfley and Deister Plat-O tables are used for concentration of the coarser sizings and for the slime section of the plant Deister Plat-O, Deister Overstom tables and Luhrig vanners are installed. Ores containing sulphides are concentrated and the concentrate is passed through a flotation cell. Mixed tin and wolfram ores, after concentration, pass to a magnetic separator.

★Mt. Isa Mines, Ltd., are preparing plans for the renovation and alteration of the milling and smelting plant for the simultaneous treatment of lead, zinc, and copper ores. The new design will permit of dust-free milling. The latest estimate of ore reserves gave 2,361,514 tons of sulphide copper ore assaying 3.75 percent copper and 25,702 tons of oxidized copper ore carrying 7.1 percent copper. The lead section contains 7,055,210 tons of ore assaying 8.6 percent lead, 7.7 oz. silver, and 8.5 percent zinc; and 61,530 tons of carbonate ore carrying 14.4 percent lead and 1.2 oz. silver.

RUSSIA

Krivoi Rog iron deposit to be developed soon—Explorations reveal mineral resources

★Work will begin shortly on a newly found iron-ore deposit near Krivoi Rog with reserves equal to half of all the surveyed high-quality ore deposits in the nearby area. The deposit lies under the Saksagan River, at whose mouth this city, center of the Krivoi Rog iron-ore basin, is located. Geologists estimate that the ore reserves here run into hundreds of millions of

tons. The find was surveyed before the war, and after the region was liberated from the Germans engineers immediately set about drawing up plans for development work.

According to the project, the Saksagan River is to be diverted from its present channel and four large reservoirs are to be built. The reservoirs will irrigate some 7,500 acres of land that can be used for setting up truck farms around the mines and supplying water to the iron and steel and coke and byproducts works of the area.

★A Tbilisi engineer, V. Dzhavrishvili, has designed an automatic cable line for the transfer of freight over short distances. The potential energy of the weights themselves serves as the basis of this invention. Moving in one direction, the weights expend sufficient energy to move lighter freight in the opposite direction. Mobile containers are loaded and unloaded automatically. The People's Commissariat of the Coal Industry of the USSR decided to build an experimental cable line of this type at one of the mines. The new cable line may be put to use in the mining industry.

★According to a recent bulletin of the Soviet Embassy at Washington, more than 500 expeditions have been outfitted by the Academy of Sciences in Russia during the last 25 years to investigate mineral deposits and other natural resources. Geological calculations resulting from explorations are reported to indicate that USSR occupies first place in world resources of oil, peat, iron, manganese, apatite, phosphorites, magnesium salts, and niobium; and second place in coal, lead, zinc, and nickel.

One expedition is investigating nickel deposits of Mengetundra and Petsamo, and another is studying iron-ore deposits on the Kola Peninsula which include the so-called marsh ores and auxiliary minerals.

Bureau of Mines Reports 1945 Mercury Imports

General imports of quicksilver in August fell well below the high record monthly rates established in July and May, but were higher than the average monthly rates for any year prior to 1945, according to the Bureau of Mines. Of 4,417 flasks imported during August 3,002 flasks came from Spain, 1,233 flasks from Mexico, 150 flasks from Chile, and 32 flasks from Peru.

General imports of quicksilver, by countries, during the first eight months of 1945, in flasks of 76 lb. each:

From:	Jan.-Aug. 1945
Canada	1,720
Chile	750
Honduras	23
Mexico	10,998
Peru	163
Spain	38,093
Total	51,747

Exports of quicksilver from the United States averaged 30 flasks a month in the first seven months of 1945.

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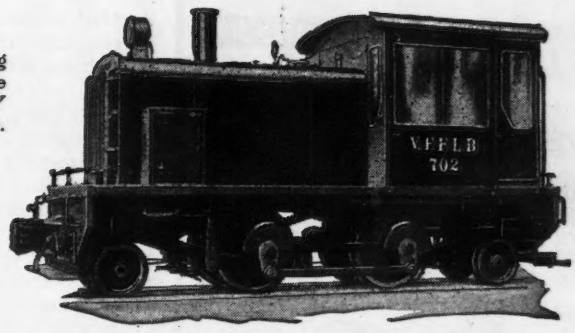

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LETTERS

(Continued from page 121)

big question is how the resulting problems are to be met by the industry, not in selfish interest alone, but in relation to the over-all responsibilities of a revival of our peacetime economy.

One of the main problems is in rehabilitation and the rebuilding of the momentum of an operation to proportions of economical operation. The crux of this problem in turn is that of financing its solution. It is something of a travesty on logic that the only existing conditions permitting government cooperation through RFC loans is confined to either new and undeveloped properties or to those which definitely have plenty of developed ore in sight. The first of these is obviously highly speculative and the second presents no particular problem in financing. However, there remains the vast field of properties which were under operation at the time they were shut down, properties falling between the two extremes mentioned in the foregoing. These properties represent a big part of the industry; hence the future of the industry and the economies of the communities involved will largely revolve about its successful solution.

Granted that past performance is not a sound measure of future possibilities in a given mine, it would be an extreme coincidence if a successful operating property which was forced to shut down at the end of 1942 had also arrived simultaneously at the end of its economic life. With highly marginal operations this could be true if the increment of increased costs now exceeds prewar margin of profit, but simple mathematics could determine that.

Assuming a shutdown property under minimum or no maintenance, it is possible to estimate fairly the necessary capital input to rehabilitate and to re-establish the lost momentum of capacity operation. This in turn can be weighed against the new margins in prospect. The amount of additional capital thus required is probably not available to most operations except those which have been fortunate enough, or had time enough, to build up cash reserves against such a contingency. The element of prospective employment or unemployment which is involved in the situation is certainly one of public interest. Therefore the following proposal:

That steps be taken immediately to permit loans by RFC to established gold mines of proved capacity to produce and with reasonable prospects of continuing to do so in the face of somewhat higher operating costs. These loans to be secured by the properties and equipment involved and amortizable out of operating profits. Furthermore, such loans should not be hedged about by undue restrictions which would interfere with maximum discretion, and maneuverability of risk would be a self-governing factor.

The risk to the loaning agency is obvious. Some of the loans so made would probably end in some loss either through depletion of ore-bodies or insufficient margin. An over-riding risk charge could be used to build up a reserve for such losses. At all events, such losses as might develop would be negligible compared to the alternative of artificial respiration for unemployment. The natural limits on loans to start with would be only a fraction of the annual mine payrolls thus stimulated. The following basis is suggested:

1. Interest rate should be only that paid by the government for money, not to exceed 3 percent.

2. An over-riding "risk charge" of 10 percent, more or less depending on indicated degree of risk, would provide a reserve of that amount against over-all losses.

3. Eligibility for such loan would be based on: (a) An established and equipped operation shut down by L-208. (b) Appraisal of ore potentials, even if speculative, considered in the light of past record, changed costs, management, and similar factors bearing on successful reopening. (c) Salvage value of the property depleted.

4. Amortization: through 50 percent of operating profit, against an over-all time limit of say five years. Interested party salaries entering into costs to be submitted for consideration with application for loan.

J. W. HOEFLING

Hoefling Brothers,
Sacramento, Calif.

Alaska Development Board Protests Public Land Order 82

The Editor:

In the course of studying problems connected with certain deterrents to Alaska's economic progress, the Alaska Development Board has had called to its attention the evident intent of the General Land Office to withhold from mining development great areas of Alaska placed under "emergency reserve" during the war.

Public Land Order No. 82, carried out "in connection with the prosecution of the war," embraces 48,800,000 acres of land in northern Alaska, approximately 15,600,000 acres in the Alaska Peninsula, and approximately 3,040,000 acres in the Katalla-Yakataga area—an area roughly one-sixth of the entire Territory.

According to Fred W. Johnson, Commissioner of the General Land Office, "It is not anticipated that the order will be modified to permit mining locations under the United States Mining Laws, or that the order will be vacated in its entirety in the near future."

Johnson's letter was dated Aug. 28, 1945, and was addressed to Alaska Delegate E. L. Bartlett.

Concerning this letter and the stated policy of the General Land Office, The Alaska Development Board went on record with the following statement:

"A very disturbing feature of the Commissioner's response to Mr. Bartlett is the evident intent of the General Land Office to continue this order in effect in spite of the fact that the war is over. It seems probable that this may represent an effort to substitute mineral leasing provisions for the private tenure of mineral lands which is now provided by existing law, a policy which is openly advocated by the Commissioner of the General Land Office."

Further, the Board declared, "Unless it can be demonstrated that the War Department still desires for military purposes the use of the lands withdrawn, it would appear that this order is being continued in effect by the General Land Office for some purpose other than that for which the order was originally promulgated. If this is the case, it would seem a definite and vigorous protest from the Alaska Development Board is quite in order. Such procedure definitely obstructs the development of the resources of the Territory."

The Alaska Development Board believes that if Public Land Order No. 82 is continued in effect, great harm will result to the Territory of Alaska and suggests that continuation of such practice represents a serious contradiction of American principle.

The Board respectfully submits this matter for your consideration and, we hope, for your support.

ERNEST GRUENING
Chairman, Alaska Development Board
Juneau, Alaska, Sept. 14, 1945